



Model SD0921A

**Model**D0920A  
D0920D  
D0920K  
D0920U  
D0930S  
SD921A  
SD921S**SAFETY PRECAUTIONS**

See Page 1.

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**Howard W. Sams & Co.**

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co. as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co. by the manufacturers of the particular type of replacement part listed.

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SET 2698 FOLDER 2



## SAFETY PRECAUTIONS

### SERVICE WARNING

Service work should be performed only by qualified service technicians who are familiar with safety checks and guide lines.

1. For continued safety, no modification of any circuit should be attempted unless recommended by manufacturer.
2. Disconnect power source before replacing parts as some parts may be electrostatic sensitive.
3. Use an isolation transformer between the line cord and power receptacle, when servicing chassis.

### SERVICING HIGH VOLTAGE AND PICTURE TUBE

When servicing the High Voltage circuits, extreme caution should be used.

1. Discharge static High Voltage by connecting a 10 kohms resistor in series with a test lead between chassis and anode lead of picture tube.
2. Wear shatter-proof eye protection (goggles) when handling the picture tube in case of implosion.
3. DO NOT lift picture tube by the neck.

### X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Service personnel should be aware of the procedures and instructions covering x-ray radiation. The only potential source of x-ray in present day solid state receivers and monitors is the picture tube.

1. It is only when High Voltage is excessive that x-ray radiation is capable of being emitted from shell of picture tube. Be sure the High Voltage is set at specified level.
2. An accurate High Voltage meter should be available at all times. Meter calibration should be checked periodically.
3. High Voltage should be kept at rated value - NO HIGHER. Higher voltages may cause x-ray radiation or failure of other associated components. DO NOT depend on protection circuit to keep voltages at rated value.
4. Every time a chassis is serviced, High Voltage should be checked at various brightness levels to be sure it is regulating properly.
5. While troubleshooting a set with excessive High Voltage, avoid being close to picture tube. DO NOT operate longer than it is necessary to locate the cause of excessive High Voltage. Use a variable AC transformer to regulate voltage.
6. Many components, electrical and mechanical, in present chassis have safety related characteristics which are not evident with visual inspection. When these components are known, they are identified with a # on the schematic and in the parts list. When replacing these components, for SAFETY, use only an equivalent replacement part.

### SAFETY CHECKS-FIRE AND SHOCK HAZARD

#### Cold Leakage Checks (Sets with isolated ground.)

1. Unplug the AC cord and connect a jumper across the two prongs on the plug.
2. Turn on power switch.
3. Measure the resistance, with an Ohm meter, between the jumpered AC plug and any exposed metal cabinet parts on the set such as: antenna screw heads, control shafts, handle brackets. Exposed metal parts that have a return path should measure between 200 kohms and 5 megohm. Parts without a return path must measure infinity.

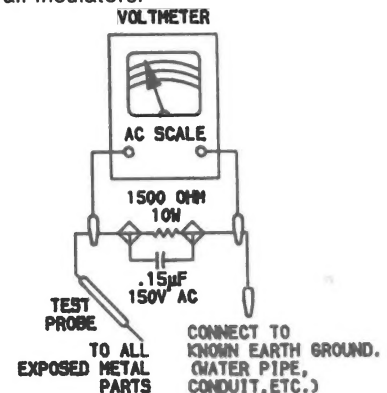
#### Leakage Current Hot Check

1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
2. Connect a 1500 Ohm 10 watt resistor, in parallel with a .15 $\mu$ F 150V AC capacitor, between any exposed metal parts on the set and a good earth ground such as a water pipe. (See Figure below.)
3. Using an AC volt meter, with 1000 Ohms per volt or more sensitivity, measure the voltage across the resistor. Check each exposed part and measure voltage at each point.
4. Reverse the AC plug and repeat voltage measurement at each point.
5. The voltage at any point should not exceed .75 volts RMS. This corresponds to .5 milliamps AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected.

### GENERAL GUIDE LINES

A final SAFETY check before returning the set to customer.

1. Check area repaired for poorly soldered or de-soldered connections. Check entire circuit board surface for solder splashes.
2. Check interboard wiring for pinched wires or wires contacting any high-wattage resistors.
3. Check that all control knobs, shields, covers, grounds and mounting hardware have been replaced. Be sure to replace all insulators.



## TROUBLESHOOTING AID

Note: Waveforms taken with triggered scope, Keyed-Rainbow generator. Schematic voltages measured with digital meter, no signal. Controls adjusted for normal operation.

### PICTURE or SOUND

NO PIC, NO SOUND, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (TX3204). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (TX3204). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (TX3204) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

NO PIC, HAS SOUND, HAS RASTER: Refer to "Troubleshooting" Video circuit.

HAS PIC, NO SOUND: Refer to "Troubleshooting" Audio circuit.

OVERLOADED PICTURE: Refer to "Troubleshooting" IF-AGC circuit.

LOW OR EXCESSIVE BRIGHTNESS: Check Video and Luminance circuits. Refer to "Troubleshooting" Video circuit.

### SWEEP

NO RASTER, HAS SOUND: Check HV rectifier, Part of Horizontal Output Transformer (TX3204). Refer to "Troubleshooting" Horizontal circuit.

NO RASTER, NO SOUND: Refer to "Troubleshooting" Horizontal circuit.

NO VERT DEFLECTION: Refer to "Troubleshooting" Vertical circuit.

POOR VERT LIN OR FOLDOVER: Refer to "Troubleshooting" Vertical circuit.

POOR HORIZ LIN OR FOLDOVER: Refer to "Troubleshooting" Horizontal circuit.

NARROW PICTURE: Refer to "Troubleshooting" Horizontal circuit.

VERT OFF FREQUENCY: Refer to "Troubleshooting" Vertical circuit.

HORIZ OFF FREQUENCY: Refer to "Troubleshooting" Horizontal circuit.

### SYNC

NO VERT/HORIZ SYNC: Refer to "Troubleshooting" Sync circuit.

### RASTER

YELLOW (NO BLUE): Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

CYAN (NO RED): Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

MAGENTA (NO GREEN): Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

### COLOR (B/W operating normally)

NO COLOR: Refer to "Troubleshooting" Chroma circuit.

WEAK COLOR: Refer to "Troubleshooting" Chroma circuit.

NO COLOR SYNC: Refer to "Troubleshooting" Chroma circuit.

NO GREEN: Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

NO BLUE: Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

NO RED: Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

INCORRECT HUE (TINT): Refer to "Troubleshooting" Chroma circuit.

# TROUBLESHOOTING

## POWER SUPPLY

Check the AC Fuse (FX3299). If Fuse is open, check Capacitors C3270, C3271, C3272, CX3299, Diodes CRX3271 thru CRX3274 and Thermistor (RX3297). Apply 120VAC, turn set on and check for 151V\* at the cathode of Diode CRX3273. If this voltage is missing, check Power Switch (S3201) and Line Filter (TX3298). If 151V\* is present at the cathode of Diode CRX3273, check for 123V\* at pin 4 of Regulator IC (ICX3202). If this voltage is missing, check ICX3202, Horizontal Output Transistor (QX3208) and associated components. Check for a brief pulse of approximately 60VDC at the cathode of Diode CR3216. If the pulse is missing, check the voltage and components associated with Multivibrator, Start-Up Transistors (Q3210, Q3213 and Q3224). If the pulse is present at the cathode of CR3216 and the voltage at pin 4 of ICX3202 is 171V, refer to the "Horizontal" section of this Troubleshooting guide.

\* With respect to isolated ground.

## HORIZONTAL

Inject a horizontal signal at the base of the Horizontal Output Transistor (QX3208), turn set on and remove injected signal if the set operates normally. If the set continues to operate after the injected signal is removed, check the voltages, and components associated with the Start-Up Circuit Transistors (Q3210, Q3213 and Q3224). If the set stops operating after the injected signal is removed, check the voltages, waveforms and components associated with pins 6, 7, 31, 32, 33, 36, 37, 38 and 41 of Video/Chroma/Horizontal/Vertical Processor IC (IC2376) and Horizontal Driver Transistors (Q3206, Q3209 and QX3202). If the set does not operate with a signal injected at the base of the Transistor QX3208, check the voltages, waveforms and components associated with Transistor QX3208 and the Horizontal Output Transformer (TX3204). Check Diodes CR3472, CR3473, CR3473A, CR3487 and associated components for defects. The High Voltage Rectifier is part of Transformer TX3204 and if defective will affect the performance of the horizontal circuits. Horizontal linearity or width problems may be caused by Capacitors CX3228, CX3229 and CX3231 being defective.

## IF-AGC

Inject a video IF signal at the IF Input and check for a picture on the CRT. If a picture is present, check Tuner, Tuner AFC circuit at pins 23 thru 27, Tuner AGC circuit at pins 11 thru 14 of the IF-AGC IC (IC1201). If a picture is missing, check for video waveform at pin 1 of Plug 1M. If the waveform is present, refer to the "Video" section of this Troubleshooting guide. If waveform is missing, apply AGC bias to pin 13 of IC1201 while monitoring pin 1 of Plug 1M with a scope. If the waveform returns, check the voltages, and components associated with pins 12 and 13 of IC1201. If the waveform does not return, check the voltages, waveforms and components associated with pins 1 thru 9, 16 thru 20, 22 thru 28 of IC1201, Video Emitter Follower Transistor (Q1229). See the AGC Voltage Chart for voltages that change with signal.

NOTE: Voltages taken using a key-rainbow generator signal.

## AGC VOLTAGE CHART

IC1201	
Pin 11	3.8V
Pin 13	6.48V

## AUDIO

Inject a modulated sound IF signal at Test Point C2 and turn the volume to Maximum. If sound is heard at the speaker, refer to the "IF-AGC" section of this Troubleshooting guide. If no sound is heard at the speaker, check the speaker, Plugs 4P4, 4K4 and check the voltages, and components associated with pins 1, 2, 3, 6 thru 11 and 14, 15 and 16 of the Audio Det Amplifier IC (IC1451) and Sound Mute Transistor (Q1455).

## VIDEO

Inject a video signal at pin 1 of Plug 1M on Test Point CV and check for video on the CRT. If video is present, refer to the "IF-AGC" section of this Troubleshooting guide. If no video is present on the CRT, check for a video waveform at pins 25, 26 and 27 of Video/Chroma/Horizontal/Vertical Processor IC (IC2376). If there is no video at pins 25, 26 and 27 of IC2376, check the voltages, waveforms and components associated with pins 9, 22 thru 31, 34 and 35 of IC2376. If video is present at pins 25, 26 and 27 of IC2376, check the CRT and the voltages, waveforms and components associated with Output Transistors (Q5100 thru Q5105). If the brightness is inadequate or cannot be controlled, check the voltages and components associated with pins 24, 29 and 30 of IC2376 and pin 8 of the CRT.

## VERTICAL

Inject a vertical drive signal at pin 42 of Video/Chroma/Horizontal/Vertical Processor IC (IC2376). If vertical sweep is now present, check the voltages, waveforms and components associated with pins 3, 40 and 42 of IC2376. If there is still no vertical deflection, check the voltages, waveforms and components associated with the Vertical Output IC (IC2100) and the Deflection Yoke. Vertical linearity or height problems may be caused by Electrolytics C2131, C2148, C2149 and C2552 being defective.

## SYNC

Check for a video waveform at pin 4 of Video/Chroma/Horizontal/Vertical Processor IC (IC2376) if waveform is missing, check the components associated with pin 4 of IC2376. If a video waveform is present at pin 4 of IC2376, check for the proper vertical waveforms at pins 2, 3, 40 and 42 of IC2376 and horizontal waveforms at pins 32, 37, 38 and 39 of IC2376.

## RASTER

Check the CRT and CRT voltages. If there is no red, check the voltages and components associated with pin 26 of Video/Chroma/Horizontal/

## TROUBLESHOOTING (Continued)

Vertical Processor IC (IC2376) and Red Drive and Output Transistors (Q5101, Q5104). If there is no green, check the voltages and components associated with pin 25 of IC2376 and Green Drive and Output Transistors (Q5102, Q5105). If there is no blue, check the voltages and components associated with pin 27 of IC2376 and Blue Drive and Output Transistors (Q5100, Q5103). If the raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power Supply" sections of this Troubleshooting guide.

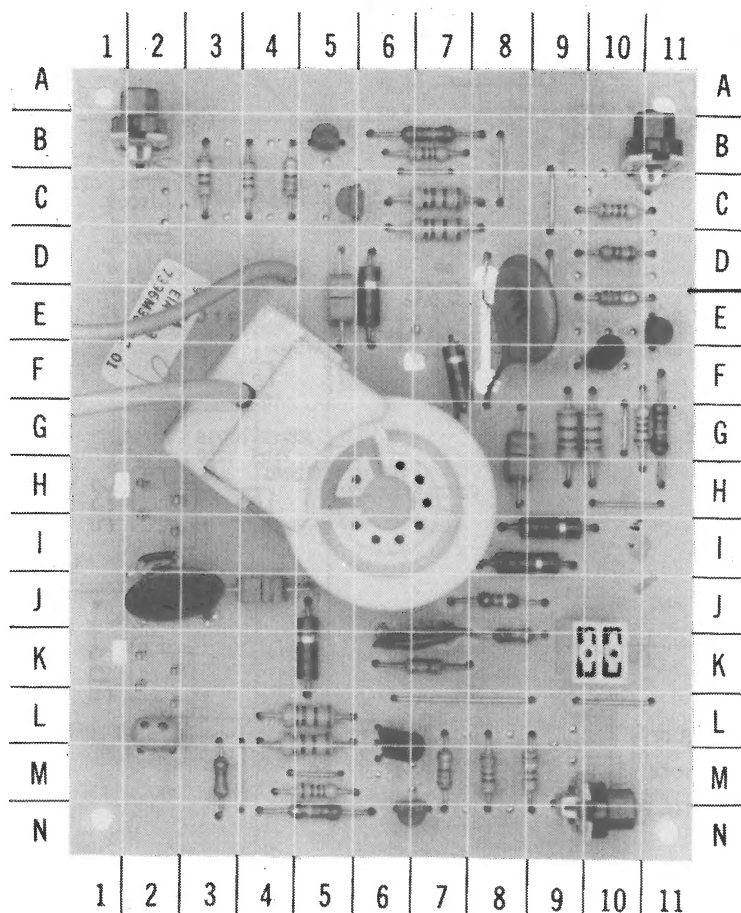
### CHROMA

Check for a chroma waveform at pin 10 of Video/Chroma/Horizontal/Vertical Processor IC (IC2376). If waveform is missing, check components associated with pin 10 of IC2376. If

the waveform is present at pin 10 of IC2376, check for the proper chroma waveforms at pins 25, 26 and 27 of IC2376. If the chroma waveforms are missing, check voltages, waveforms and components associated with pins 10 thru 27 of IC2376. Check the voltages, waveforms and components associated with Color Control and pin 11 of IC2376. Check the 3.58MHz oscillator at pins 16 thru 19 of IC2376. If there is no color sync, check the adjustment of the Color Filter Control (R2390) and associated components. If there is inadequate tint range, check the voltages and components associated with the Tint Control and pin 20 of IC2376. If the proper chroma waveforms are present at pins 25, 26 and 27 of IC2376, refer to the "Raster" section of this Troubleshooting guide.

### CRT BOARD-GridTrace LOCATION GUIDE

C5100	K-7	L5100	L-2	R5105	C-3	R5120	C-7	R5141	M-3
C5101	I-2	Q5100	N-6	R5109	M-8	R5121	L-5	5A3	K-2
C5103	M-7	Q5101	E-11	R5110	D-10	R5122	G-9	5C2	H-2
C5104	E-10	Q5102	B-5	R5111	C-4	R5123	C-7	5L	K-10
C5105	C-4	Q5103	M-6	R5112	N-10	R5124	K-5	5X3	E-7
C5109	J-2	Q5104	F-10	R5113	B-11	R5125	I-9		
C5110	E-8	Q5105	C-5	R5114	B-2	R5126	E-6		
DAG	D-4	R5100	M-5	R5115	N-5	R5136	F-7		
E5100	J-4	R5101	G-11	R5116	G-11	R5137	K-8		
E5101	H-8	R5102	B-7	R5117	B-7	R5138	J-8		
E5102	E-5	R5103	M-9	R5118	L-5	R5139	K-7		
E5103	E-8	R5104	C-10	R5119	G-10	R5140	I-9		



## TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

Equipment	B&K Precision Equipment No.	Sencore Equipment No.	Notes
OSCILLOSCOPE	1541A, 2120, 2125, 2160	SC61	
GENERATORS			
RGB	1249, 1260	RG67	
MULTIBURST SIGNAL	1251, 1260	VA62A	
COLOR BAR	1211A, 1249, 1251, 1260	VA62A, CG25, NT64	
ANALOG VOM	114, 117, 177, 214		
DIGITAL VOM	388HD, 2900 SERIES	DVM37, DVM56A, SC61	
FREQUENCY METER	1803, 1804, 1805	FC71, SC61	
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44 PR-28(HV)	HP200 TP212	
ISOLATION TRANSFORMER	TR110, 1604, 1653, 1655	PR57	
CAPACITANCE ANALYZER	820, 810, 830	LC76, LC101, LC102	
CRT ANALYZER	467, 470, 480, 490	CR70	
TEMPERATURE PROBE	TP-28, TP-30		
AC LEAKAGE TESTER,	1655	PR57	
LOGIC PROBE	DP51, DP21		
LOGIC PULSER	DP101, DP31		
INDUCTANCE ANALYZER	875A	LC76, LC101, LC102	
FLYBACK YOKE TESTER	875A	VA62A, LC76, LC101, LC102	
TV STEREO GENERATOR	2009	ST65, ST66	
TV STEREO POWER MONITOR		SR68	
FIELD STRENGTH METER		FS73, FS74	
TRANSISTOR TESTER		TF46	
VIDEO ANALYZER		VA62A	

## TV ALIGNMENT INSTRUCTIONS

Use an Isolation transformer and observe power supply polarity. Maintain line voltage at 120V AC. Allow a 20-minute warm-up period for receiver and test equipment.  
Suggested Alignment Tools:

GC-THORSEN

L1426.....9293, 9294

## PRELIMINARY INSTRUCTIONS

Set the channel selector to the highest unused channel. Set scope sweep to external. Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator. Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a usable indication.

Note: Response may vary slightly from that shown.

Adjust AGC Delay Control (R1231) fully clockwise.

Connect a +6 Volt Bias to AGC-TP.

Set Phase Adjust Control (R1213) to midrange.

Connect a DC meter to Test Point C2. With no signal.

Adjust Zero Carrier Control (R1244) for +7 Volts.

Remove meter.

# **TV ALIGNMENT INSTRUCTIONS (Continued)** **VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)**

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To Test Point CV	To IF Input J1201	44MHz (10MHz Sweep)	45.00MHz	Adjust Oscillator Coil (L1230) to position oscillator at 45.00MHz marker. See Figure 1.
"	"	"	41.25MHz 42.17MHz 45.00MHz 45.75MHz	Adjust Limiter Coil (L1209) and Phase Adjust Control (R1213) for Maximum 45.75MHz (Maintaining oscillation at 45.00MHz). See Figure 2.
"	"	"	44.00MHz 45.75MHz	Adjust L1204 for Maximum gain and symmetry of response. L1204 and Tuner IF Output Coil affect overall response. Adjust Oscillator Coil (L1230) to place oscillator at 44.00MHz. See Figure 3.

## **VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)**

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To Antenna Terminals	To Test Point CV	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR instructions above. See Figure 4.

## **AUTOMATIC FINE TUNING ALIGNMENT**

Connect as explained in preliminary instructions unless specified otherwise.  
Place AFC Switch to Normal position.

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To AFC Test Point	To IF Input J1201	44MHz (10MHz Sweep)	41.25MHz 45.75MHz	Adjust L1210 to place 45.75MHz marker as shown. See Figure 5.

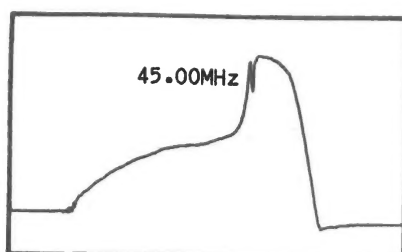


Figure 1

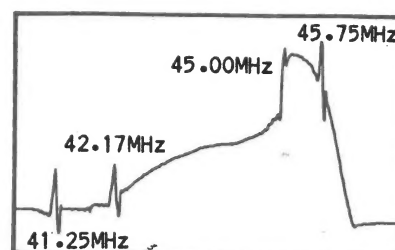


Figure 2

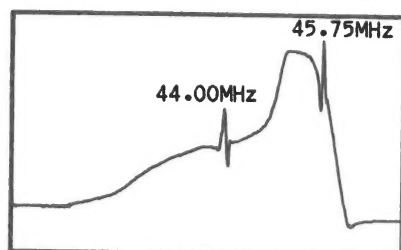


Figure 3

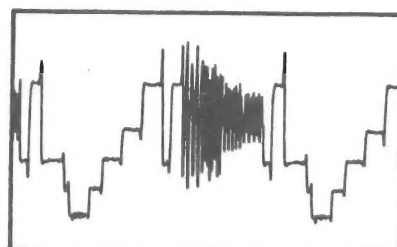


Figure 4

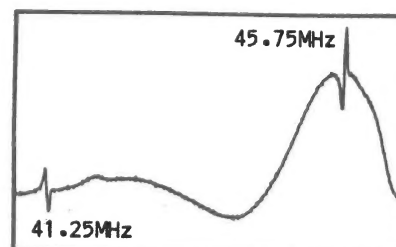
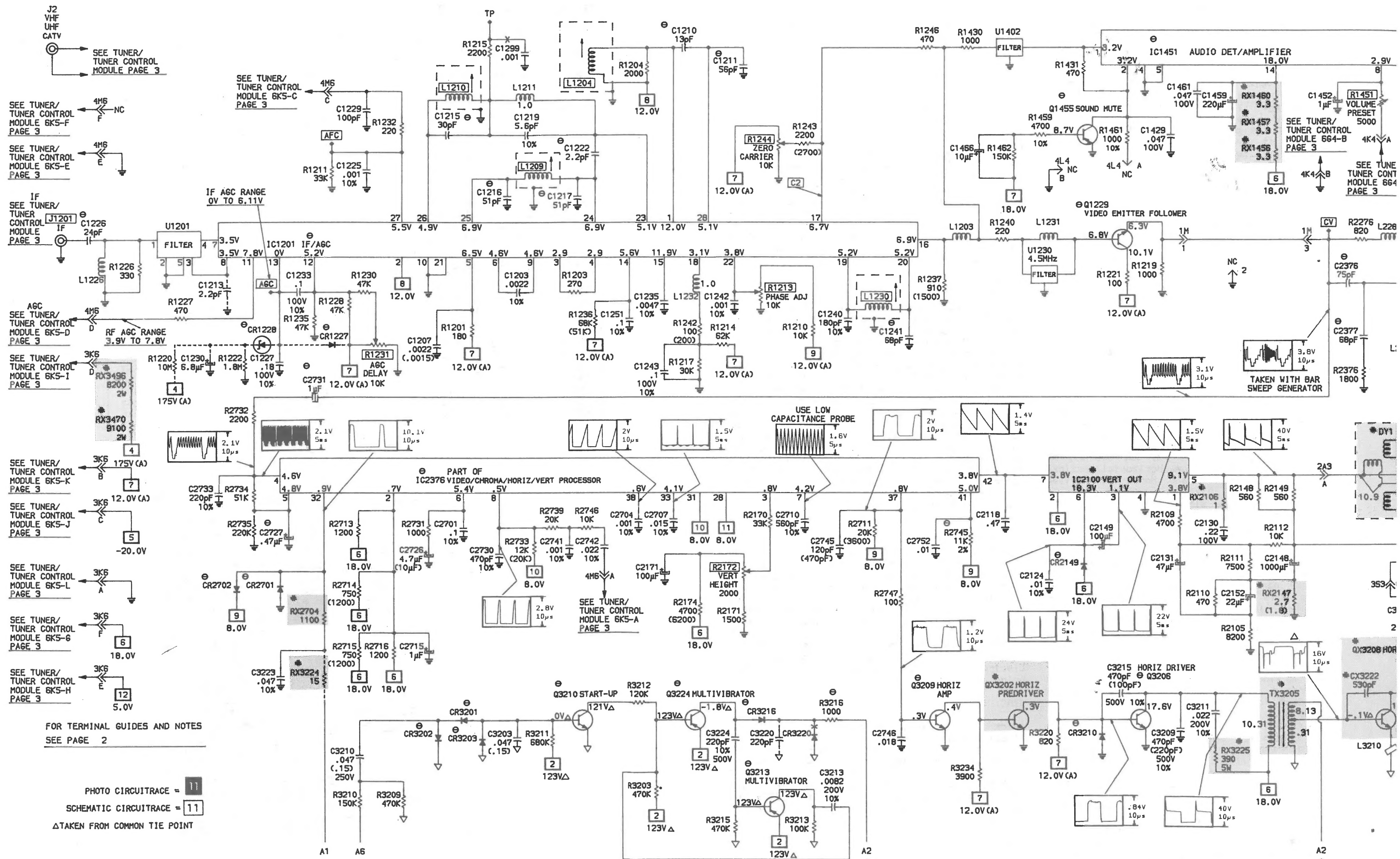


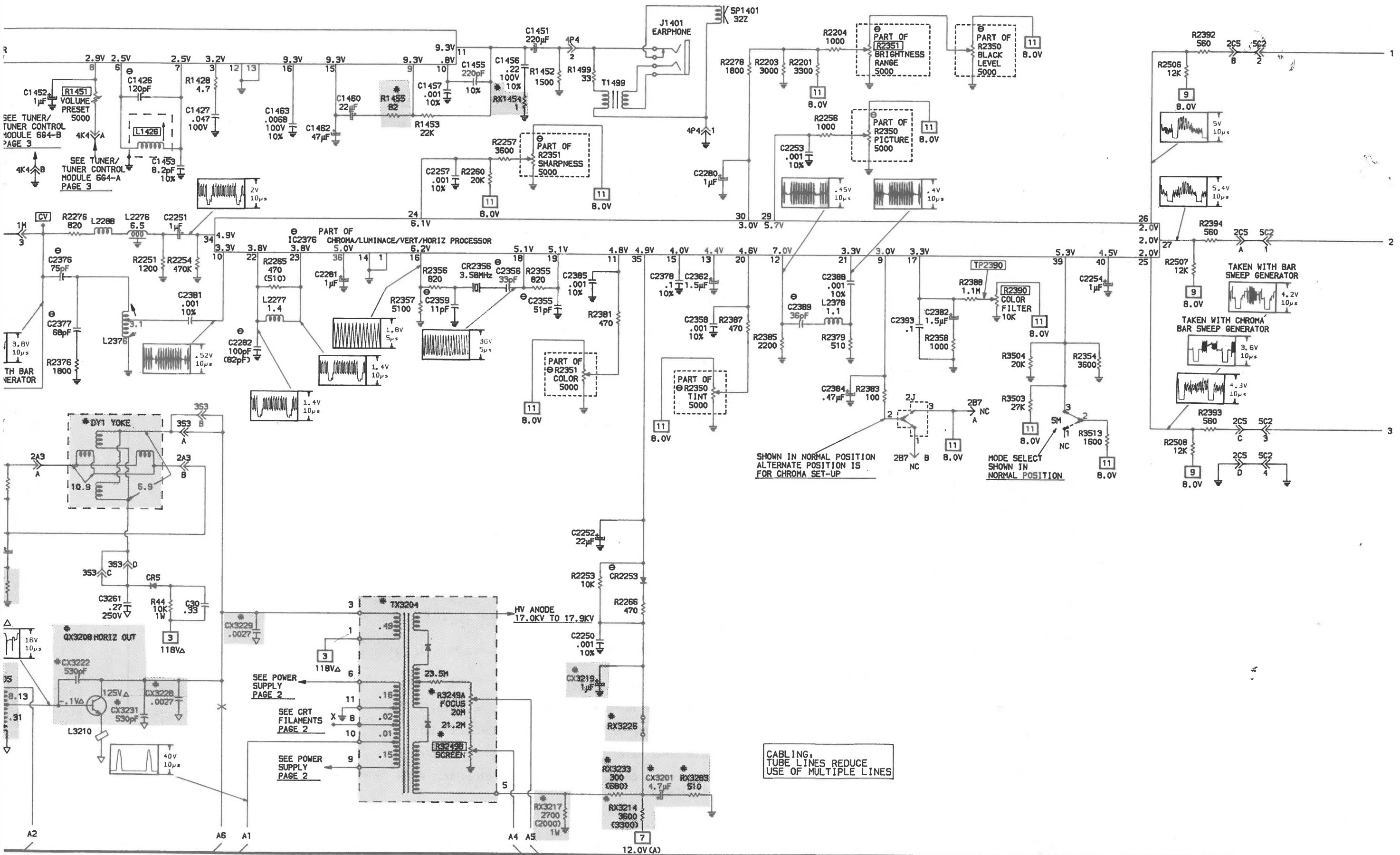
Figure 5

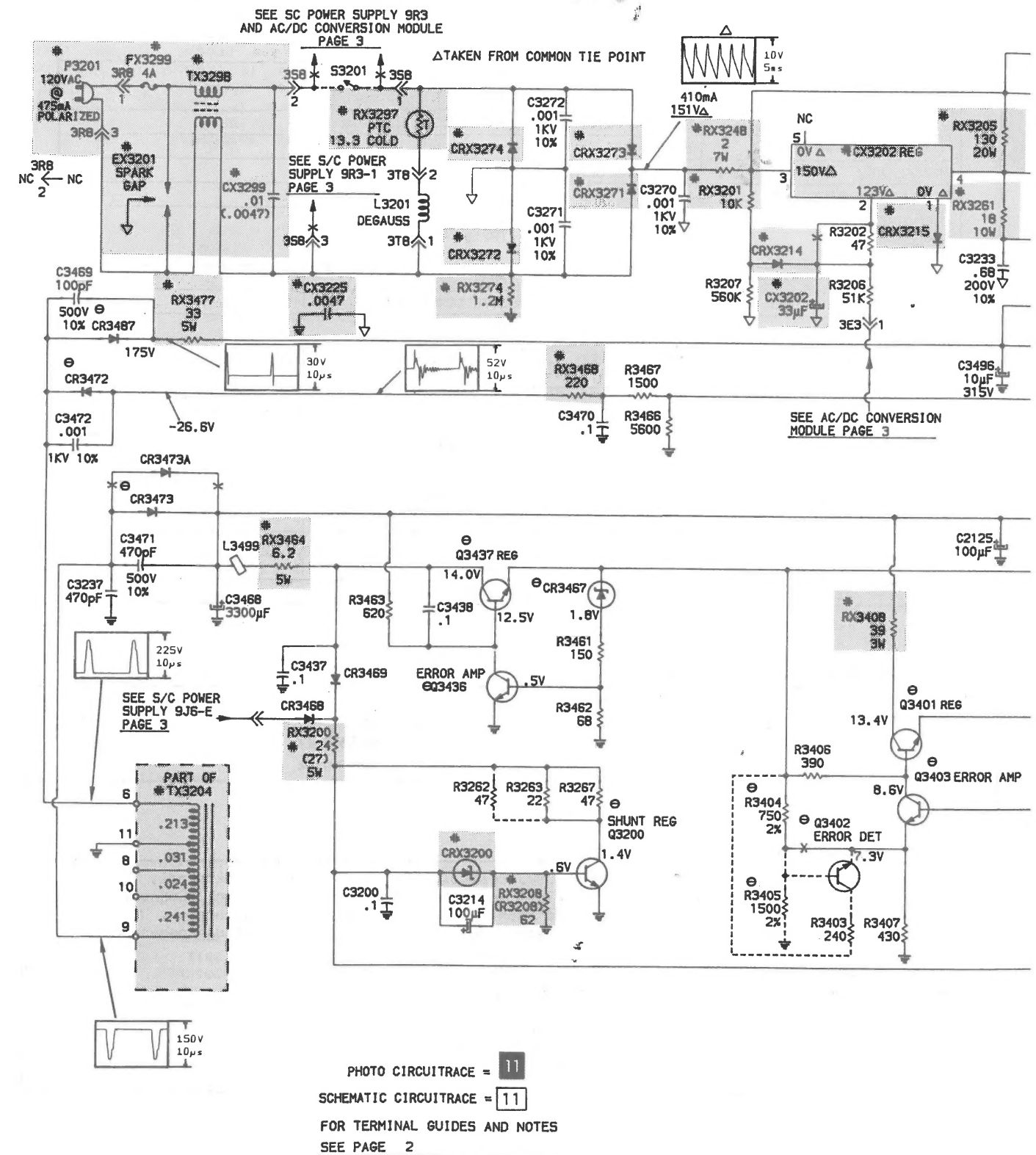
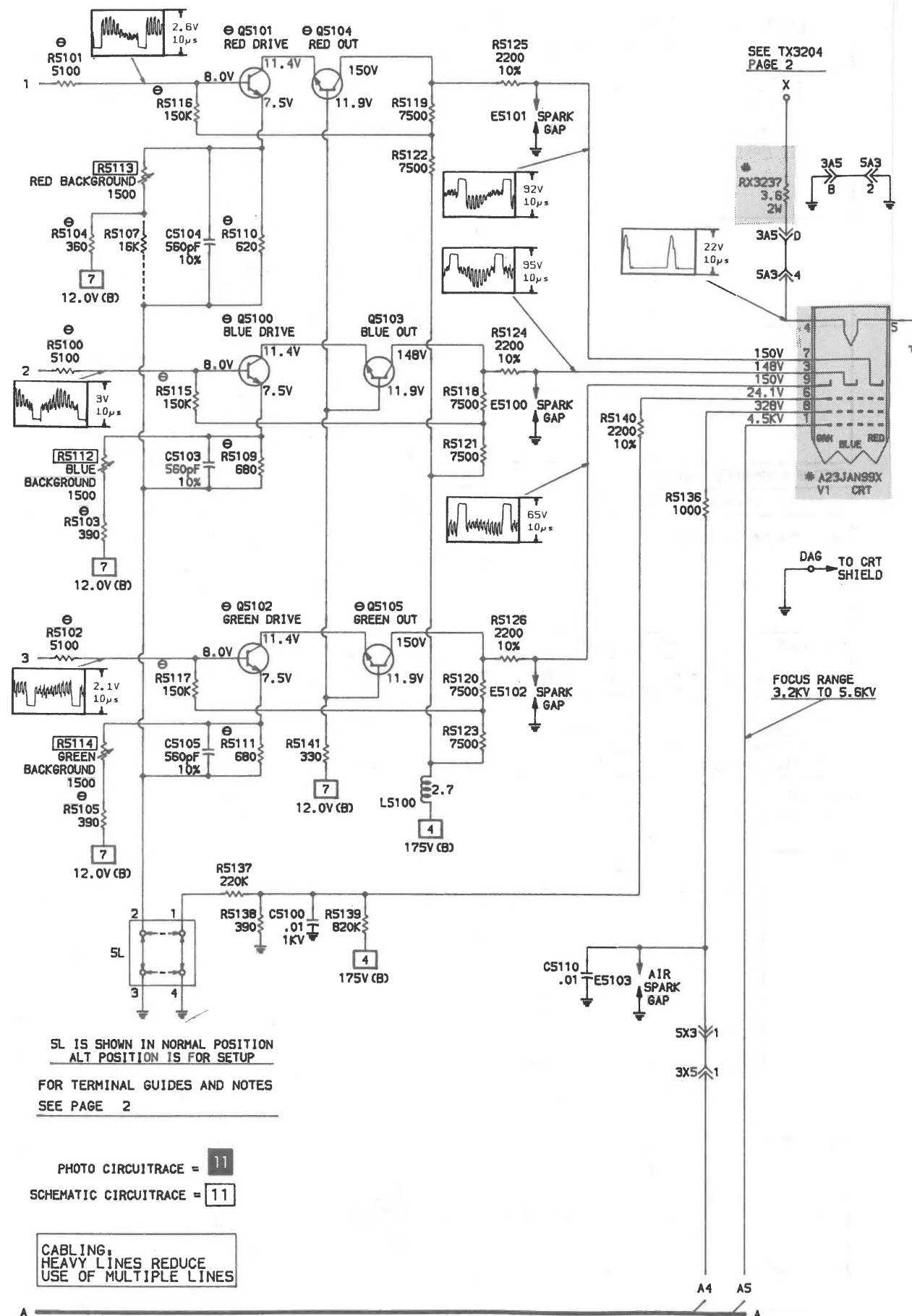
ZENITH MODELS  
D0920A/D/K/U, D0930S, SD0921A/S

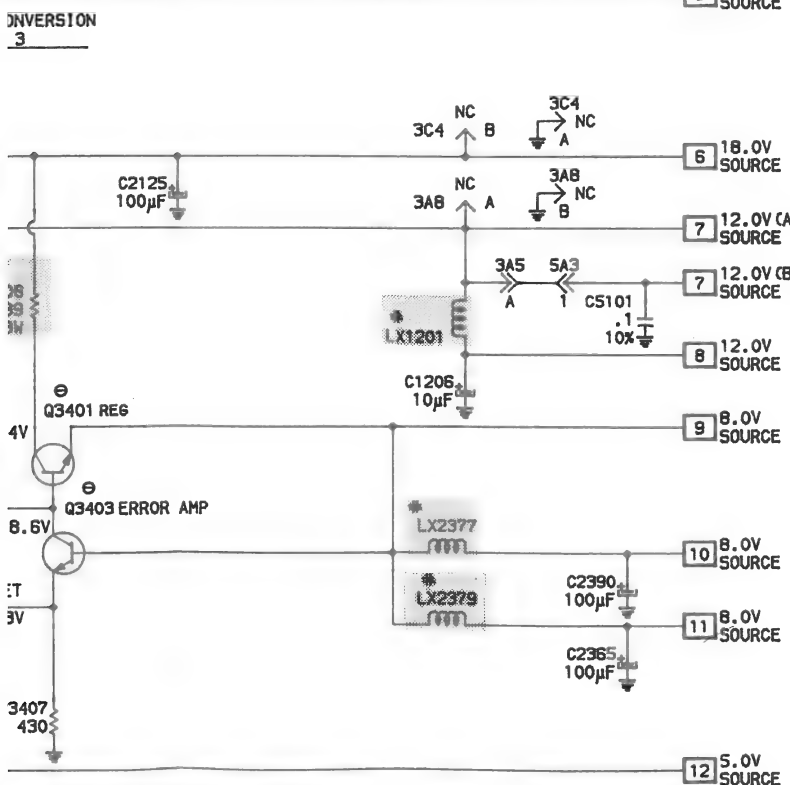
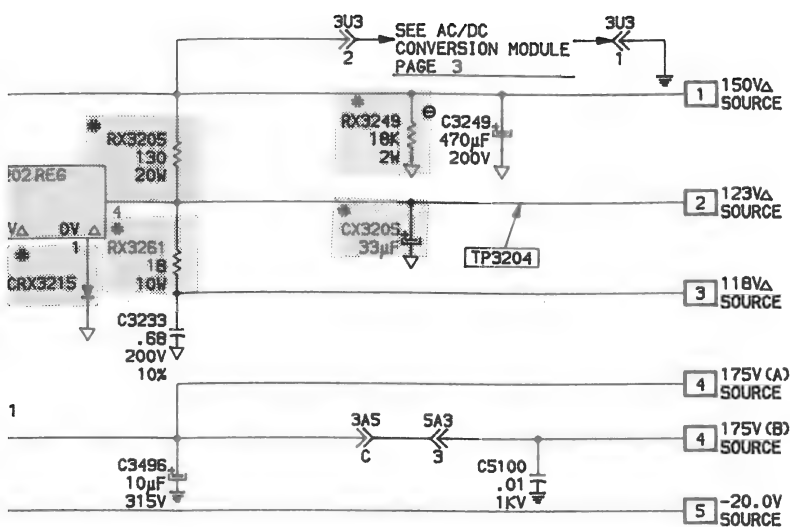




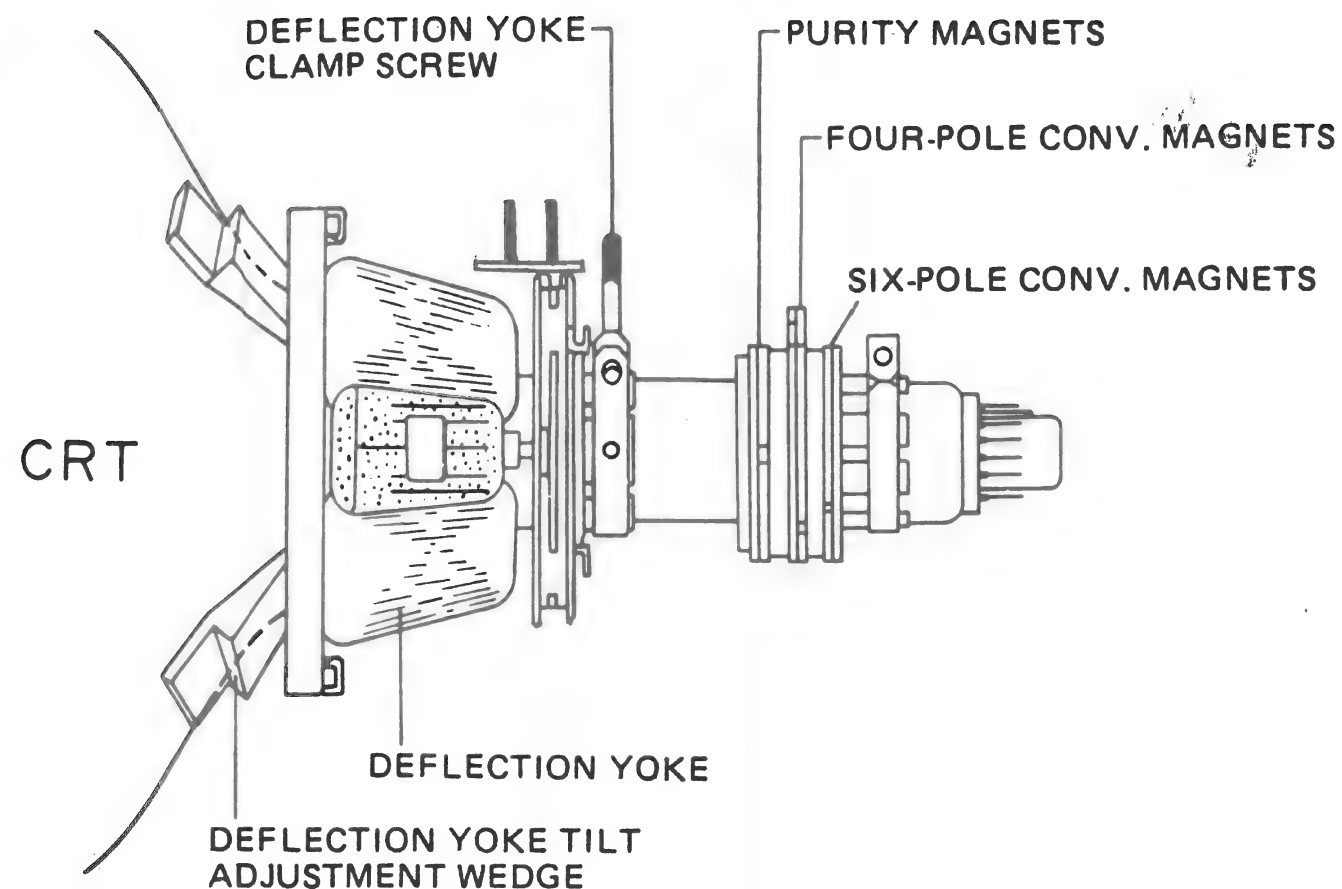








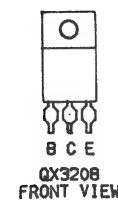
POWER SUPPLY



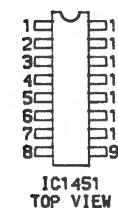
CRT NECK ASSEMBLY



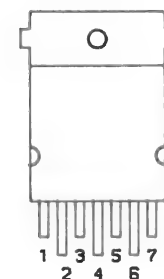
IC1201  
TOP VIEW



QX3208  
FRONT VIEW



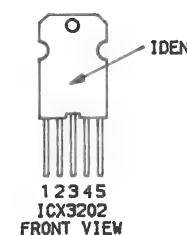
IC1451  
TOP VIEW



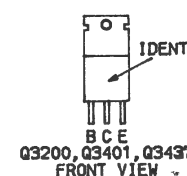
IC2100  
FRONT VIEW



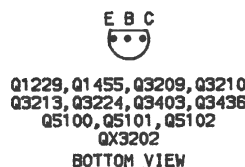
IC2376  
TOP VIEW



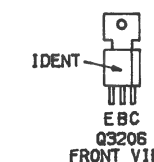
ICX3202  
FRONT VIEW



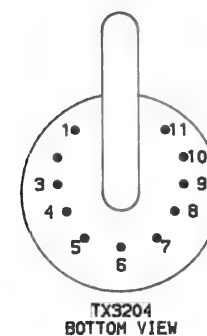
Q3200, Q3401, Q3437  
FRONT VIEW



Q1229, Q1455, Q3209, Q3210, Q3213, Q3224, Q3403, Q3436, Q5100, Q5101, Q5102, QX3202  
BOTTOM VIEW

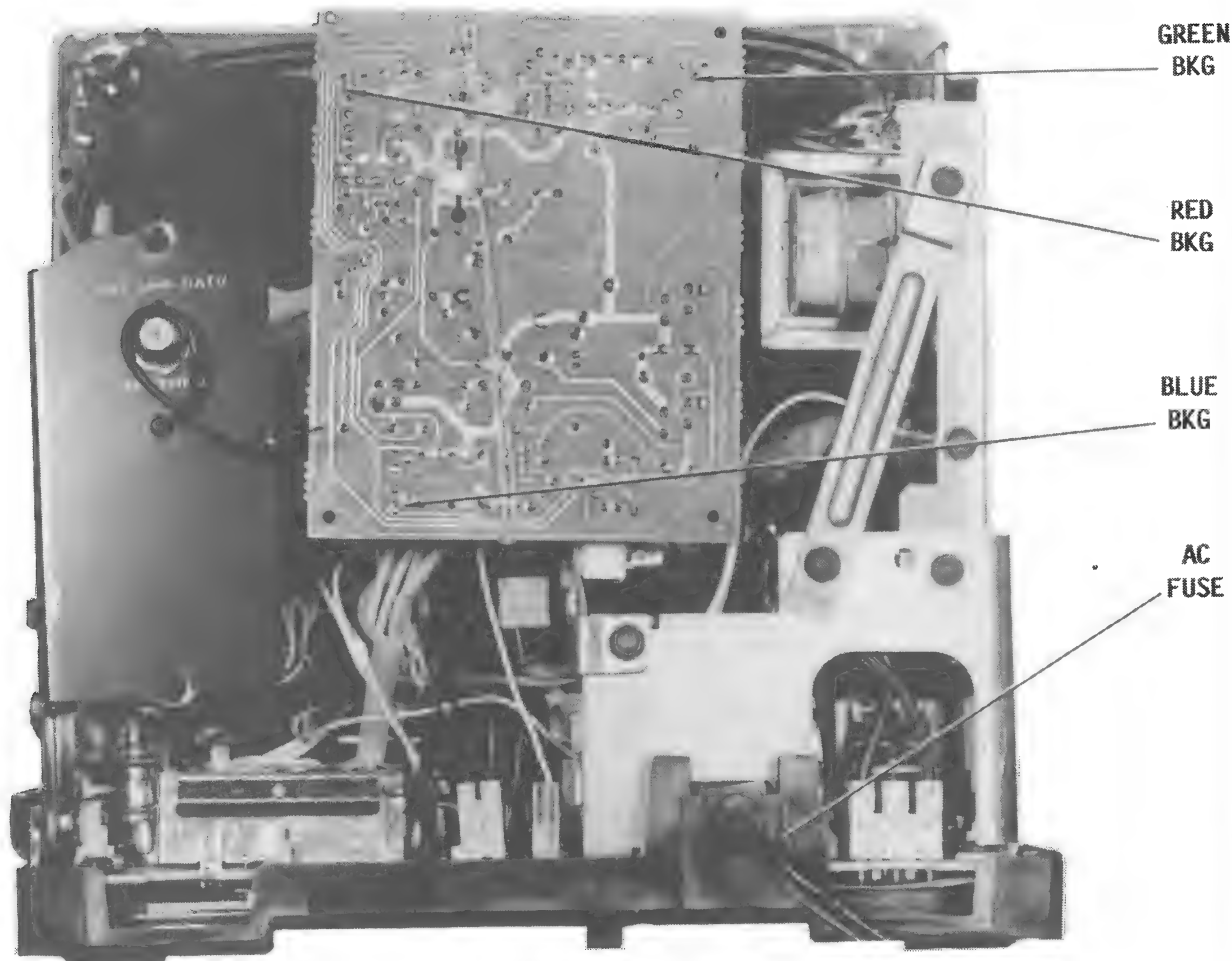


Q3206  
FRONT VIEW



TX3204  
BOTTOM VIEW

TERMINAL GUIDES AND NOTES



## CABINET-REAR VIEW

### DISASSEMBLY INSTRUCTIONS

#### CHASSIS REMOVAL

Remove six screws holding upper cabinet and remove. Disconnect speaker leads, HV anode, CRT socket, deflection yoke connector, degaussing coil connector, ground leads and all required cabling. Remove three screws holding cabinet front assembly to cabinet bottom and remove assembly from bottom. Remove nine screws holding Main board and tuner assemblies to cabinet bottom and remove assemblies from cabinet. Remove four screws holding Keyboard/Channel Dis-

play board to cabinet front and remove board from cabinet.

#### CRT REMOVAL

Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. Loosen and remove CRT neck assemblies. Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. Do not lift CRT by the neck.

### SERVICING IN THE FIELD

#### CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

#### FUSE DEVICES

A 4-amp fuse is used for AC protection. (See photo, Cabinet - Rear View.)

#### CHANNEL READOUT ACCESSIBILITY

Chassis assembly must be removed. See Disassembly Instructions.

#### CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning with ten numbered buttons. Enter button provided for one or two-digit direct entry channel selection. Fine tuning is automatic. See Channel Pretuning.

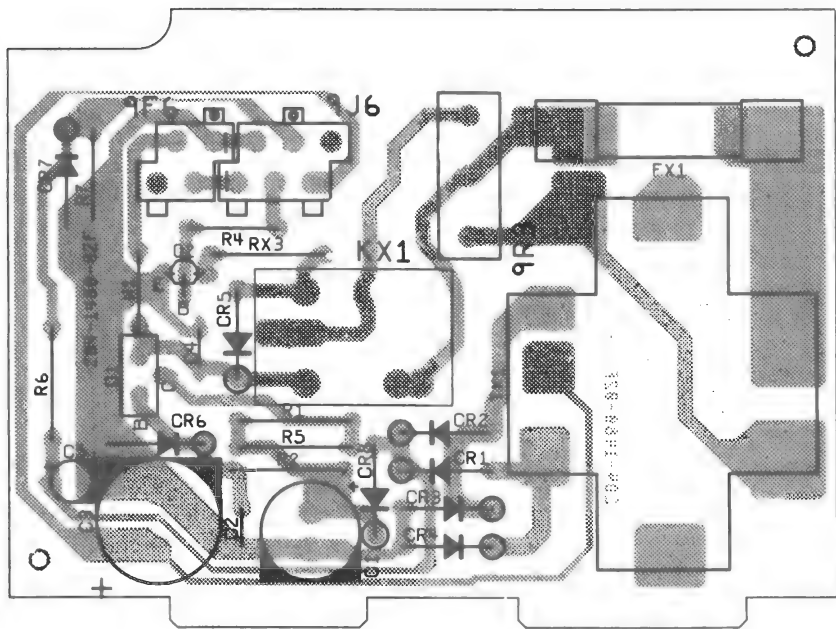
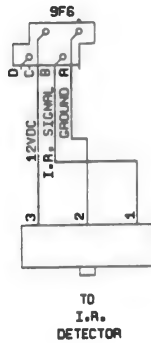
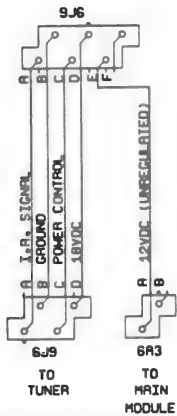
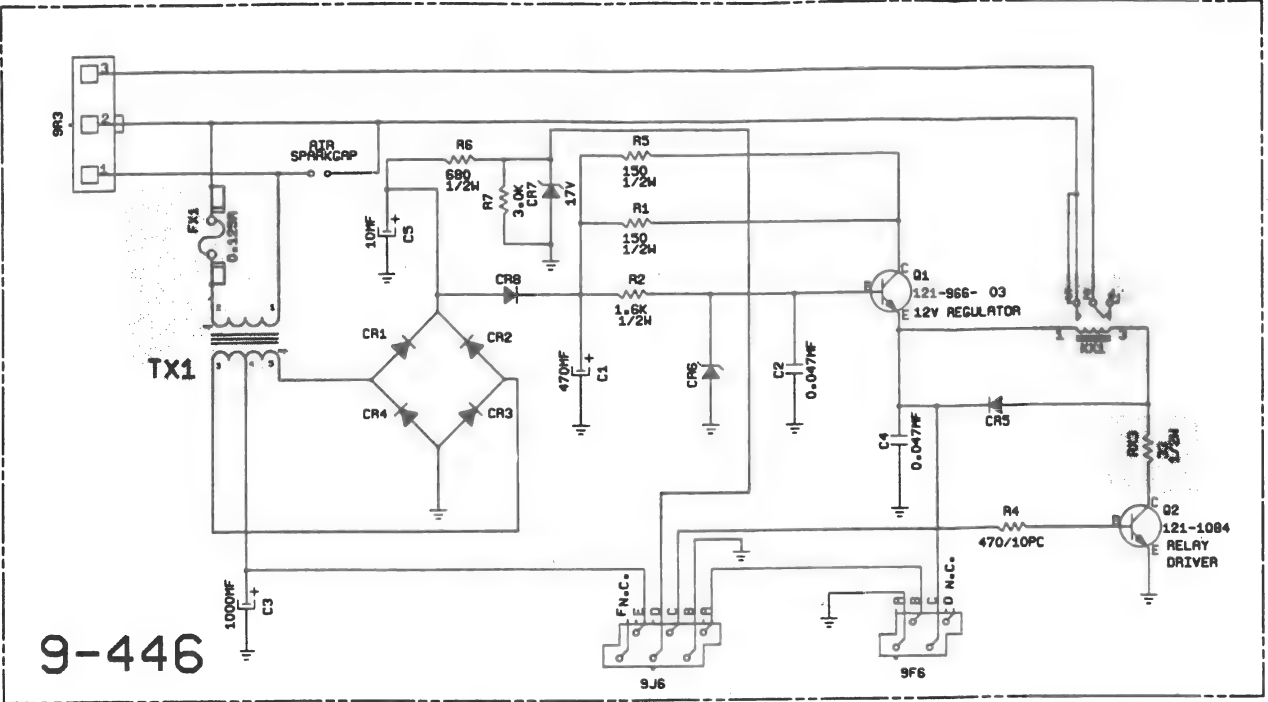
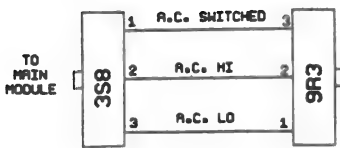
#### FOCUS

The focus may be varied by a focus control.

#### AGC

The AGC may be varied by an AGC Delay control. (See photo, Main Board - Top View.)

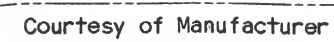
SCHEMATIC & LEGEND, 9-446 S/C POWER SUPPLY MODULE



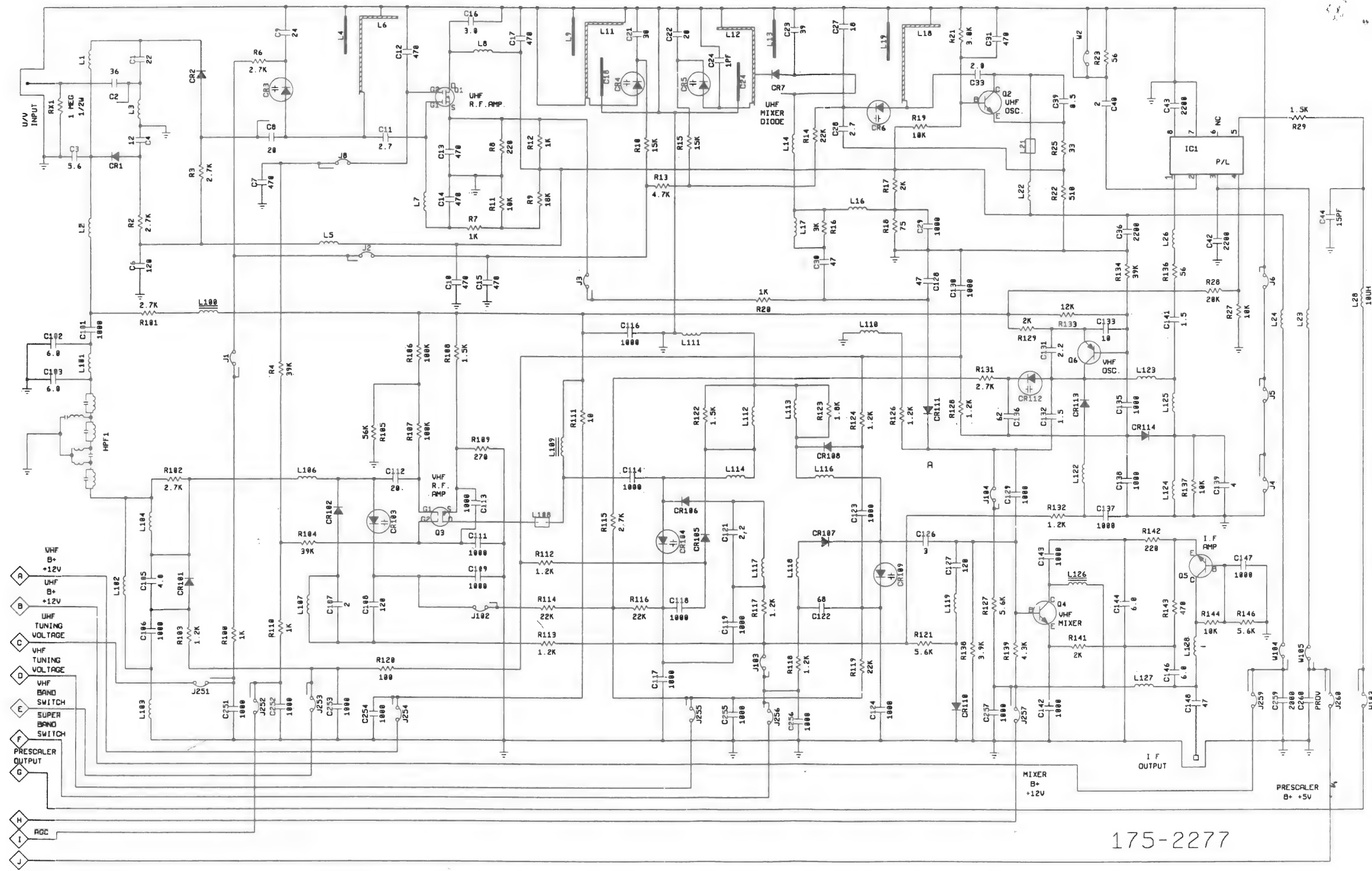
SPACE COMMAND POWER SUPPLY MODULE (9-446)

REF.NO.	PART NO.	DESCRIPTION
CAPACITORS		
C1	22-7861-12	470 MFD 20% 35V ELECTROLYTIC
C2	22-7775-20	0.047 MFD 20% 100V POLYESTER
C3	22-7860-13	1000 MFD 20% 25V ELECTROLYTIC
C4	22-7775-20	0.047 MFD 20% 100V POLYESTER
C5	22-7862-05	10 MFD 20% 50V ELECTROLYTIC
DIODES		
CR1	103-254-01	LOW VOLTAGE
CR2	103-254-01	LOW VOLTAGE
CR3	103-254-01	LOW VOLTAGE
CR4	103-254-01	LOW VOLTAGE
CR5	103-254-01	LOW VOLTAGE
CR6	103-279-22	13V 0.5W ZENER
CR7	103-279-26	17V 0.5W ZENER
CR8	103-254-01	LOW VOLTAGE
FUSE		
FX1	136-123-03 19-840-02	0.125 AMP 250V TIME DELAY FUSE FUSE HOLDER CLIP
RELAY		
KX1	195-138	RELAY SPST
TRANSISTORS		
Q1	121-966-03	NPN 12V REGULATOR
Q2	121-1084	NPN RELAY DRIVER
RESISTORS		
R1	63-10243-52	150 OHM 5% 1/2W FILM
R2	63-10243-77	1.6K OHM 5% 1/2W FILM
RX3	63-10565-36	33 OHM 5% 1/2W FILM
R4	63-10183-64	470 OHM 10% 1/4W CARBON
R5	63-10243-52	150 OHM 5% 1/2W FILM
R6	63-10243-68	680 OHM 5% 1/2W FILM
R7	63-10235-83	3K OHM 5% 1/4W FILM
TRANSFORMER		
TX1	95-3650	POWER
WIRE		
W1	91-2053	22-GAUGE TINNED
MISCELLANEOUS COMPONENTS		
64-519-01	ROLLED FLANGE EYELET (5 REQ.)	
86-799	TERMINAL PIN (13 REQ.)	

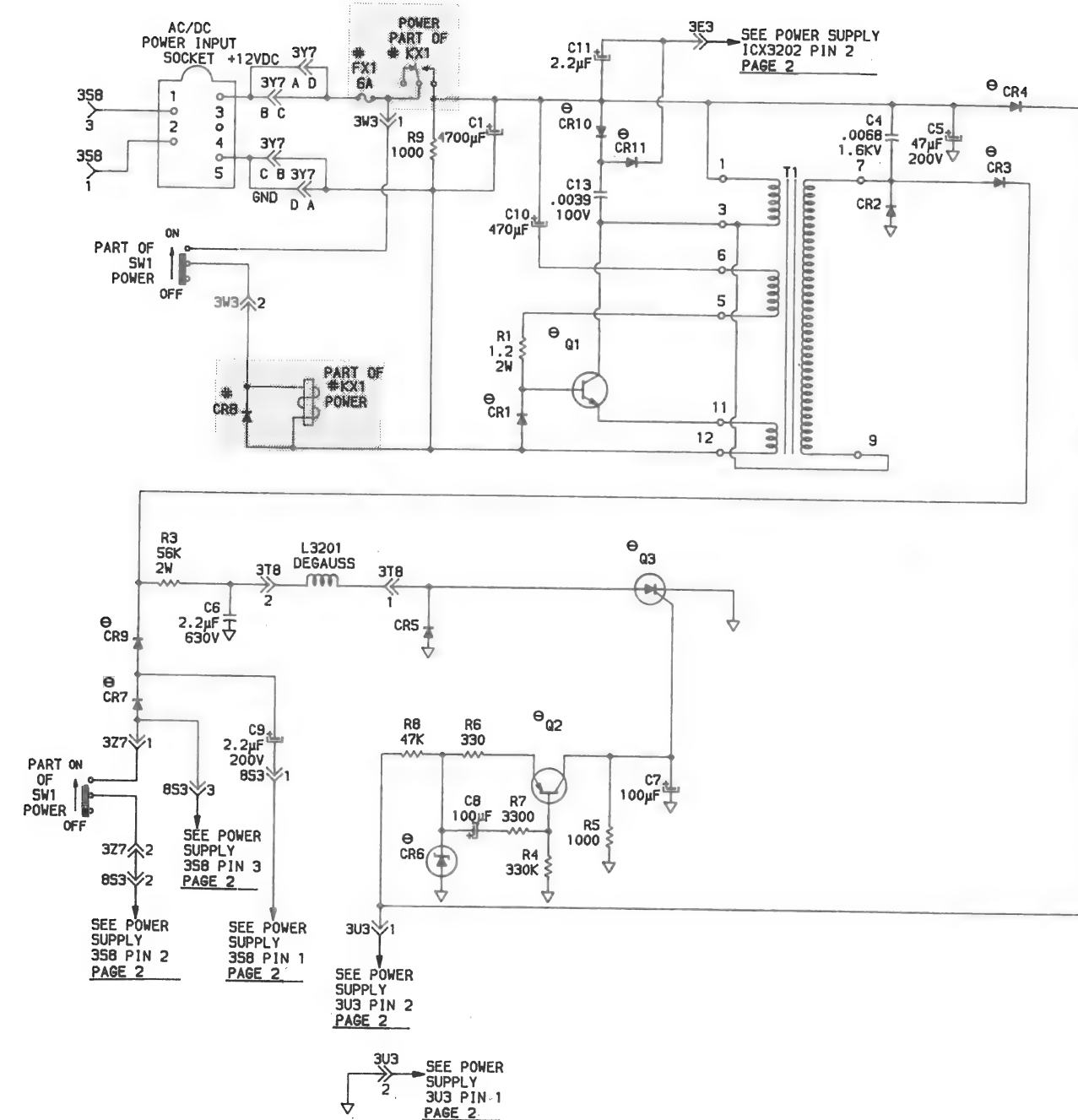




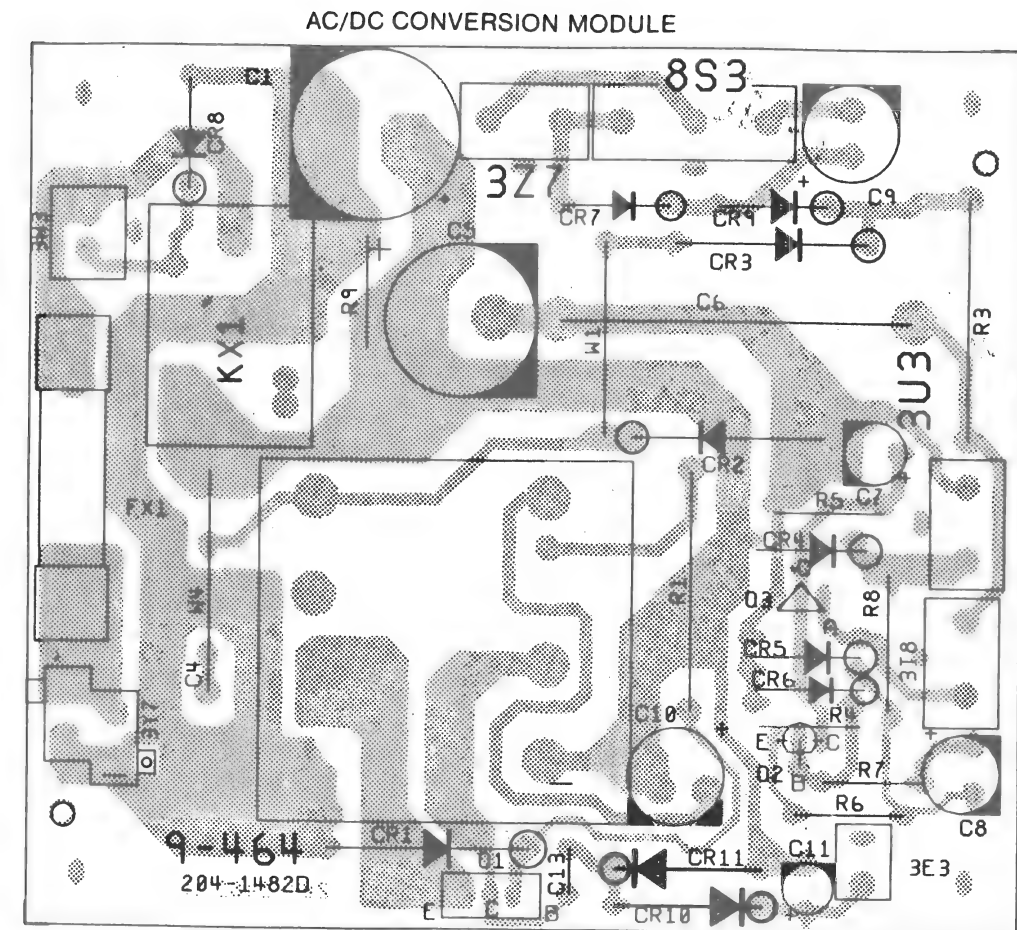




Courtesy of Manufacturer



AC/DC CONVERSION MODULE

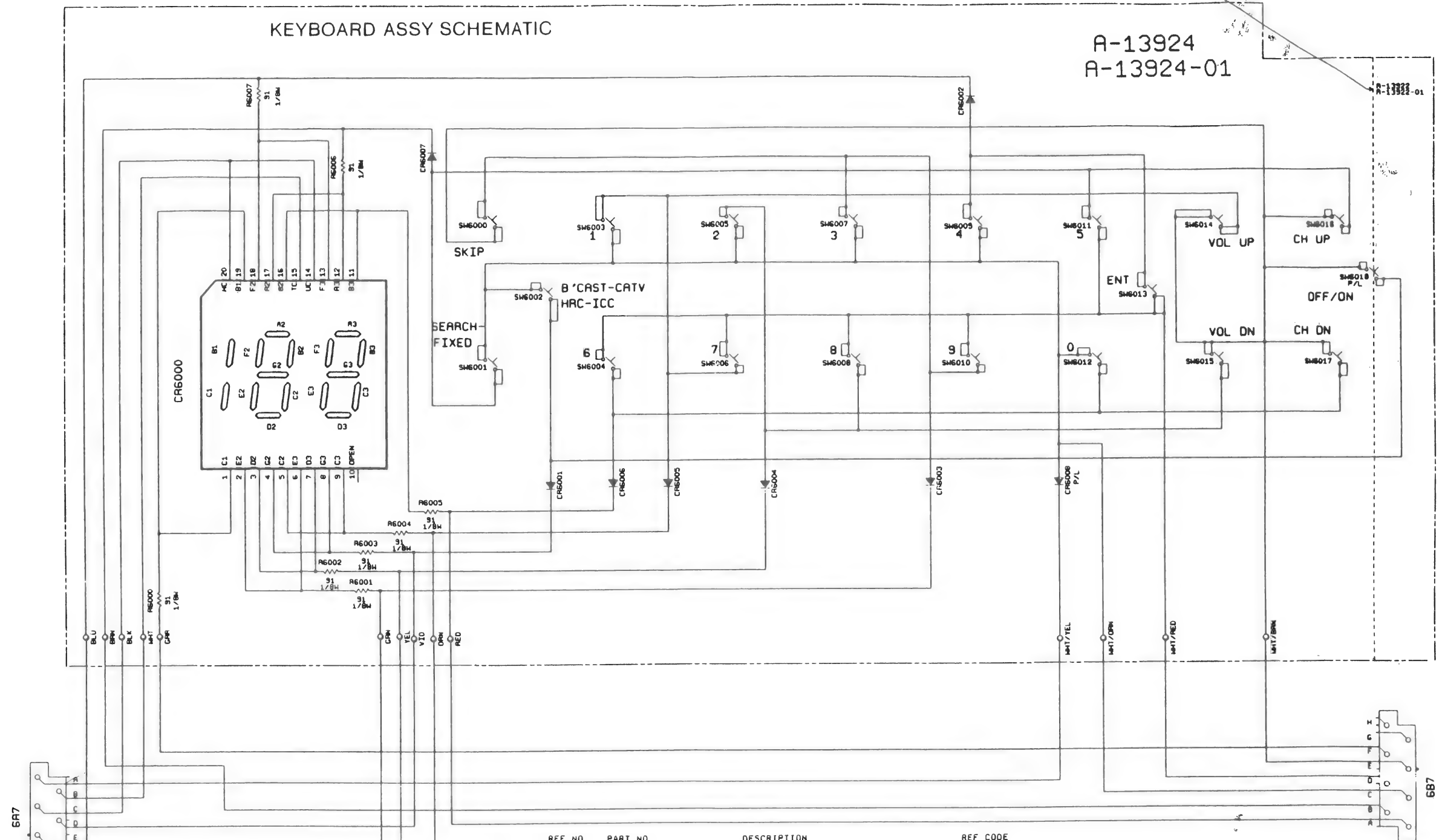


REF. NO.	PART NO.	DESCRIPTION
BRI	12-8919	METAL STAMP BRACKET MOUNTING CONVERTER
	CAPACITORS	
C1	22-7859-16	4700 MFD 20% 16V ELECTROLYTIC
C4	22-7672-26	0.0082 MFD 5% 1600V POLYPROPYLENE
	86-848	PC WIRE GRIP TERMINAL
C5	22-7809	47 MFD +50% AND -10% 200V ELECTROLYTIC
C6	22-8043	2.2MFD 10% 630V POLYESTER
	86-848	PC WIRE GRIP TERMINAL
C7	22-7858-09	100 MFD 20% 10V ELECTROLYTIC
C8	22-7860-09	100 MFD 20% 25V ELECTROLYTIC
	22-7962-07	2.2 MFD 20% 200V ELECTROLYTIC
	86-848	PC WIRE GRIP TERMINAL
C10	22-7860-12	470 MFD 20% 25V ELECTROLYTIC
	86-848	PC WIRE GRIP TERMINAL
C11	22-7864-02	2.2 MFD 20% 100V ELECTROLYTIC
C13	22-7774-07	0.003% MFD 10K 100V POLYESTER
C14	22-7786	1000pf 10% 900V DISC
C15	22-7811	1000pf 10% 1000V DISC
C16	22-7811-08	1000pf 20% 1000V DISC
C17	22-7811-03	220pf 20% 1000V DISC
C18	22-7786	1000pf 10% 900V DISC
C19	22-7786	1000pf 10% 900V DISC
	DIODES	
CR1	103-326	LOW VOLTAGE
CR2	103-298-05	LOW VOLTAGE
CR3	103-298-05	LOW VOLTAGE
CR4	103-254-01	LOW VOLTAGE
CR5	103-254-01	LOW VOLTAGE
CR6	103-279-22	13V 0.5W ZENER
CR7	103-315-04	LOW VOLTAGE
CR8	103-254-01	LOW VOLTAGE
CR9	103-298-05	LOW VOLTAGE
CR10	103-326	LOW VOLTAGE
CR11	103-326	LOW VOLTAGE
	FUSES	
F1	19-119-26	NORMAL LAG 6 AMP 250V
	19-848-02	MOLDER CLIP
	RELAY	
R1	199-119-04	RELAY
	COILS	
L1	149-454	FERRITE BEAD CORE
L2	149-454	FERRITE BEAD CORE
	TRANSISTORS	
Q1	121-1160	NPN
	19-1076	MOUNTING CLIP
	194-1367-03	INSULATING STRIP
Q2	121-973	PNP
Q3	185-16	THYRISTOR SCR

DC/AC CONVERSION MODULE (CONT.)		
RESISTORS		
R1	63-10420-26	1.2 OHM 5% 2W WW
	86-848	PC WIRE GRIP TERMINAL
R3	63-10837-14	56K OHM 5% 2W FILM
	86-848	PC WIRE GRIP TERMINAL
R4	63-10236-32	330K OHM 5% 1/4W FILM
R5	63-10235-72	1K OHM 5% 1/4W FILM
R6	63-10235-60	330 OHM 5% 1/4W FILM
R7	63-10235-84	3.3K OHM 5% 1/4 W FILM
R8	63-10244-12	47K OHM 5% 1/2W FILM
R9	63-10235-72	1K OHM 5% 1/4W FILM
TRANSFORMER		
T1	95-3827-01	INVERTER
WIRES		
W1	91-2053	22 GAUGE
W4	91-2053	22 GAUGE
MISCELLANEOUS COMPONENTS		
	A-14591	POWER PLUG AND CABLE ASSEMBLY
	43-1785	3 CIRCUIT HOUSING CONNECTOR
3R8	50-278-03	CABLE AND CONNECTOR ASSEMBLY
3Y7	50-M25-00134	CABLE AND CONNECTOR HOUSING
	58-487	DUAL SWITCHING CONNECTOR
	64-519-03	ROLLED FLANGE EYELET
	86-783	CRIMP TYPE TERMINAL (1 REQ.)
	86-799	TERM PIN (13 REQ.)
	112-793-01	6-20X0.375 RECESSED CROSS CUT
		ROUND HEAD THREAD FORM SCREW (2 REQ.)
	114-803	6-20X1/4X1/4AF HEX WASHER HEAD
		THREAD FORM SCREW (4 REQ.)
	149-535	MOUNTS PC BOARD TO BRACKET
	194-420	FERRITE CORE
	194-1715	INSULATOR INSERT
		INSULATING STRIP

Courtesy of Manufacturer

NOTE: WHEN A-13924 IS BUILT THE BOARD IS SHEARED AT THE BREAKAWAY

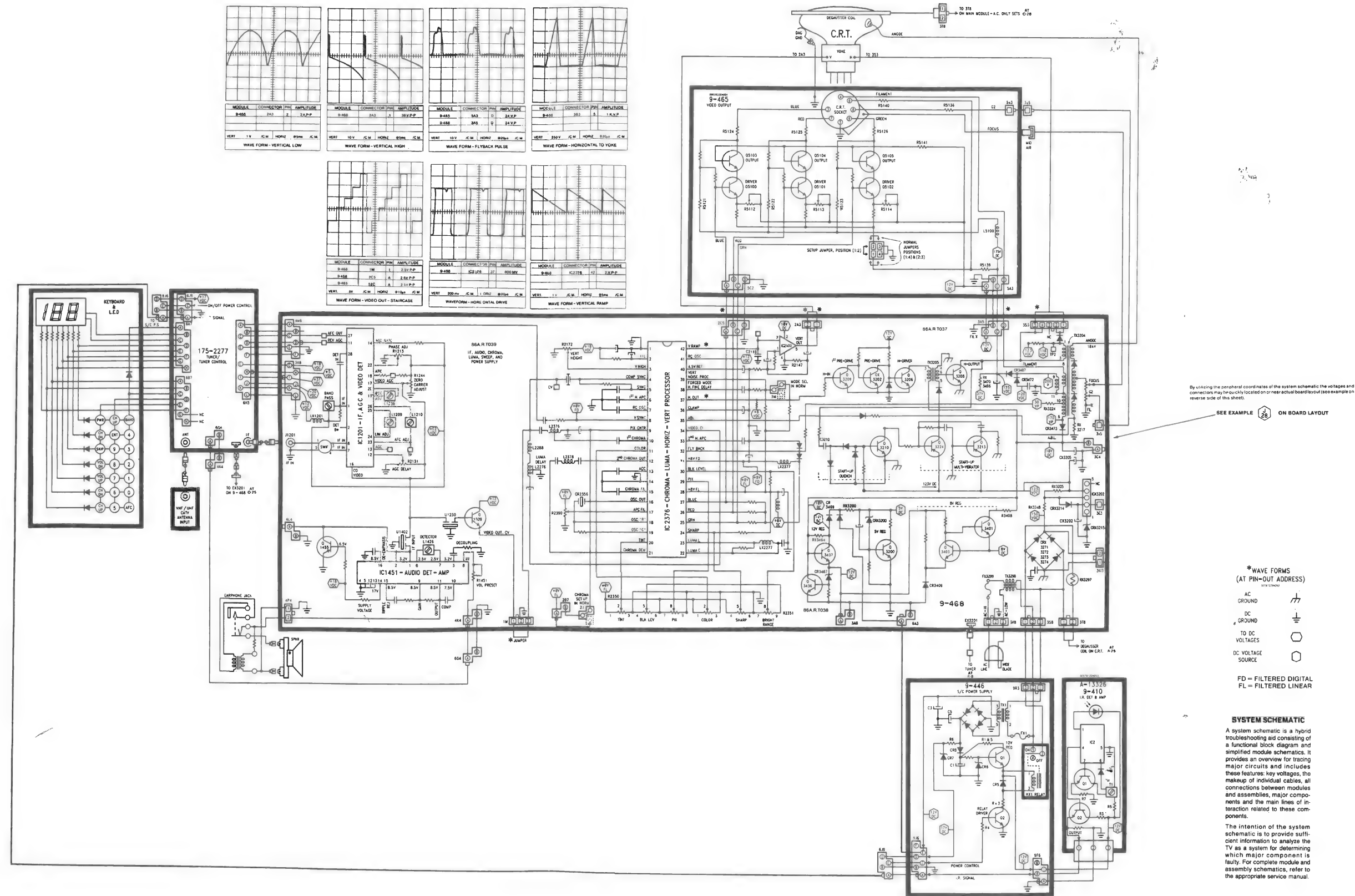


ASSEMBLY NO.	REFERENCE CODE	ASSEMBLY NO.	REFERENCE CODE
A-13922	A	A-13922-01	B
A-13924	C		

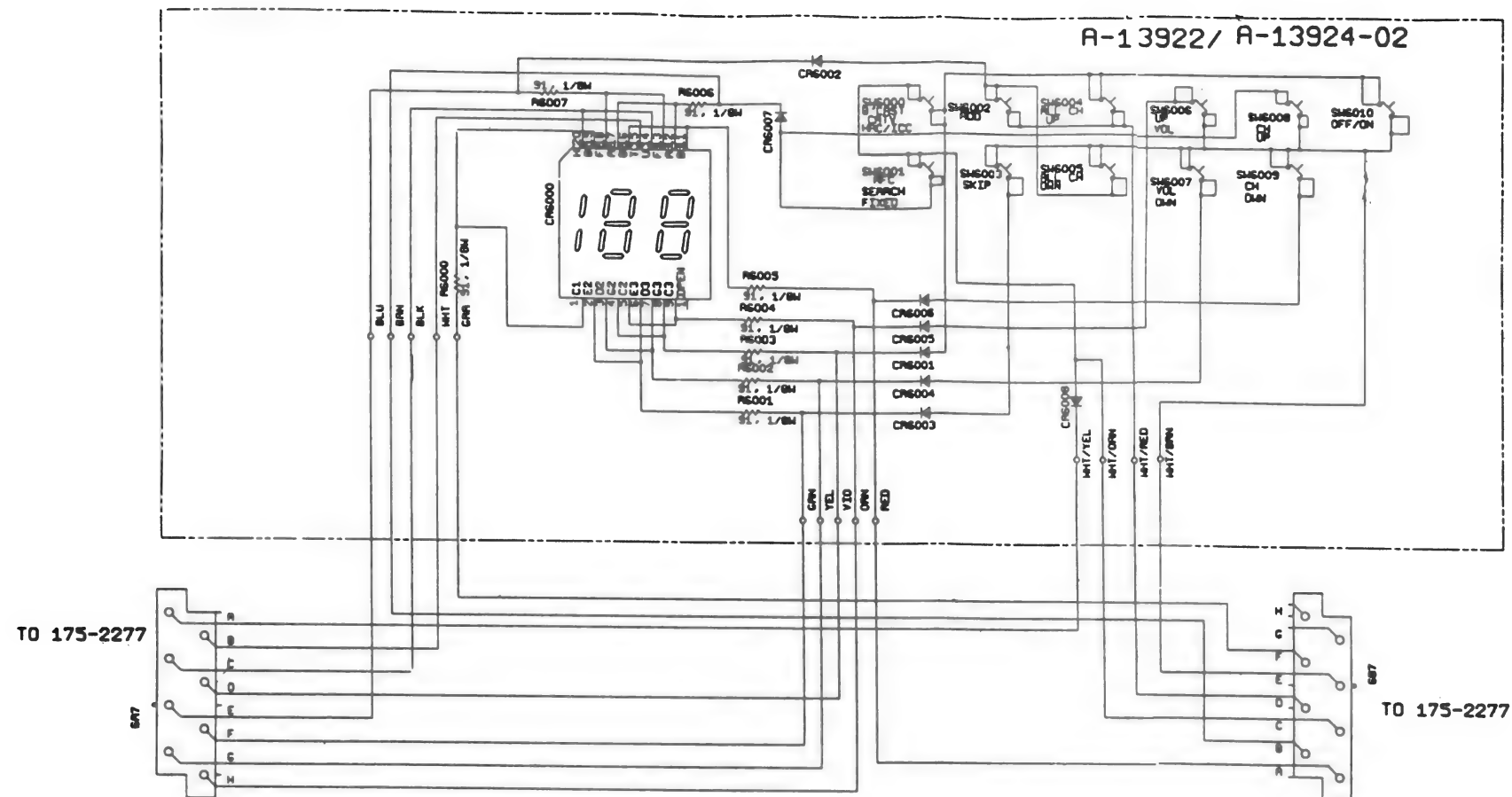
NOTE: THIS COMBINED PARTS LIST WILL ENABLE YOU TO MORE EASILY DETERMINE THE PART NUMBER OF PARTS USED ON EACH MODEL, CHASSIS OR ASSEMBLY. EACH OF THESE HAS BEEN ASSIGNED A REFERENCE CODE WHICH IS IN THE COLUMN TO THE RIGHT OF THE DESCRIPTION.

Courtesy of Manufacturer

REF NO.	PART NO.	DESCRIPTION	REF CODE	SWITCHES	
DIODES					
CR6000	75-43	LED DISPLAY MODULE	ABC	SW6000	85-1691
CR6001	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6001	85-1691
CR6002	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6002	85-1691
CR6003	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6003	85-1691
CR6004	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6004	85-1691
CR6005	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6005	85-1691
CR6006	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6006	85-1691
CR6007	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6007	85-1691
CR6008	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC	SW6008	85-1691
RESISTORS					
R6000	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6009	85-1691
R6001	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6010	85-1691
R6002	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6011	85-1691
R6003	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6012	85-1691
R6004	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6013	85-1691
R6005	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6014	85-1691
R6006	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6015	85-1691
R6007	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC	SW6016	85-1691
			ABC	SW6017	85-1691
			ABC	SW6018	85-1691



Courtesy of Manufacturer



## KEYBOARD AND LED ASSEMBLIES

ASSEMBLY NO.	REFERENCE CODE	ASSEMBLY NO.	REFERENCE CODE
A-13922	A	A-13922-01	9
A-13924	C		

NOTE: THIS COMBINED PARTS LIST WILL ENABLE YOU TO MORE EASILY DETERMINE THE PART NUMBER OF PARTS USED ON EACH MODEL, CHASSIS OR ASSEMBLY. EACH OF THESE HAS BEEN ASSIGNED A REFERENCE CODE WHICH IS IN THE COLUMN TO THE RIGHT OF THE DESCRIPTION.

REF NO.	PART NO.	DESCRIPTION	REF CODE
DIODES			
CR6000	75-43	LED DISPLAY MODULE	ABC
CR6001	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6002	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6003	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6004	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6005	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6006	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6007	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
CR6008	103-393	LEADLESS TUBULAR, HIGH FREQUENCY	ABC
RESISTORS			
R6000	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6001	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6002	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6003	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6004	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6005	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6006	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC
R6007	63-10979-23	91 OHM 5% 1/8W LEADLESS FILM	ABC

## SWITCHES

SW6000	85-1691	SKIP, PUSH-BUTTON	ABC
SW6001	85-1691	SEARCH FIXED, PUSH-BUTTON	ABC
SW6002	85-1691	BAND, PUSH-BUTTON	ABC
SW6003	85-1691	(1), PUSH-BUTTON	ABC
SW6004	85-1691	(6), PUSH-BUTTON	ABC
SW6005	85-1691	(2), PUSH-BUTTON	ABC
SW6006	85-1691	(7), PUSH-BUTTON	ABC
SW6007	85-1691	(3), PUSH-BUTTON	ABC
SW6008	85-1691	(8), PUSH-BUTTON	ABC
SW6009	85-1691	(4), PUSH-BUTTON	ABC
SW6010	85-1691	(9), PUSH-BUTTON	ABC
SW6011	85-1691	(5), PUSH-BUTTON	ABC
SW6012	85-1691	(0), PUSH-BUTTON	ABC
SW6013	85-1691	ENT, PUSH-BUTTON	ABC
SW6014	85-1691	VOL UP, PUSH-BUTTON	ABC
SW6015	85-1691	VOL DOWN, PUSH-BUTTON	ABC
SW6016	85-1691	CHANNEL UP, PUSH-BUTTON	ABC
SW6017	85-1691	CHANNEL DOWN, PUSH-BUTTON	ABC
SW6018	85-1691	OFF/ON, PUSH-BUTTON	ABC

## JUMPERS

W1	63-10979	ZERO OHM 5% 1/8W LEADLESS FILM	ABC
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## CABLES

6A7	50-W25-00025	CABLE AND CONNECTOR HOUSING	C
6A7	50-W25-00072	CABLE AND CONNECTOR HOUSING	AB
6B7	50-W25-00026	CABLE AND CONNECTOR HOUSING	C
6B7	50-W25-00111	CABLE AND CONNECTOR HOUSING	AB

## MISCELLANEOUS COMPONENTS

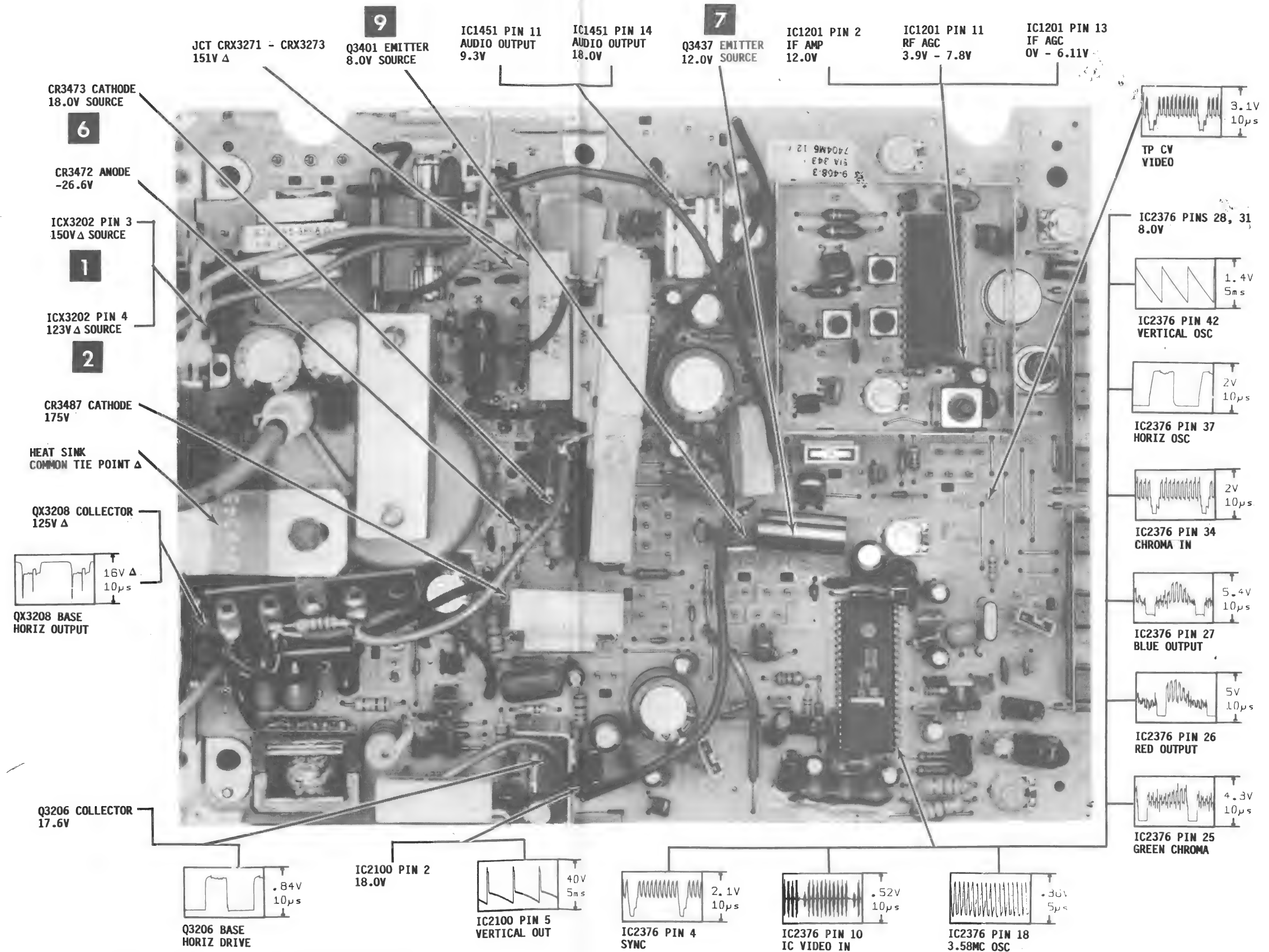
46-10460	PUSH-BUTTON KNOB ARRAY	C
46-10461	PUSH-BUTTON KNOB ARRAY	A
46-10462	PUSH-BUTTON KNOB ARRAY	B
64-1032	CRIPLET (14 REQ.)	
82-351	GROUND PLATE	AB
82-349	GROUND PLATE	C
112-2071	4-24X1/4 RECESSED CROSS CUT PAN HEAD (4 REQ.)	ABC
194-1647-01	THREAD CUT SCREW (4 REQ.)	ABC
	FOAM CUSHION	ABC

Courtesy of Manufacturer

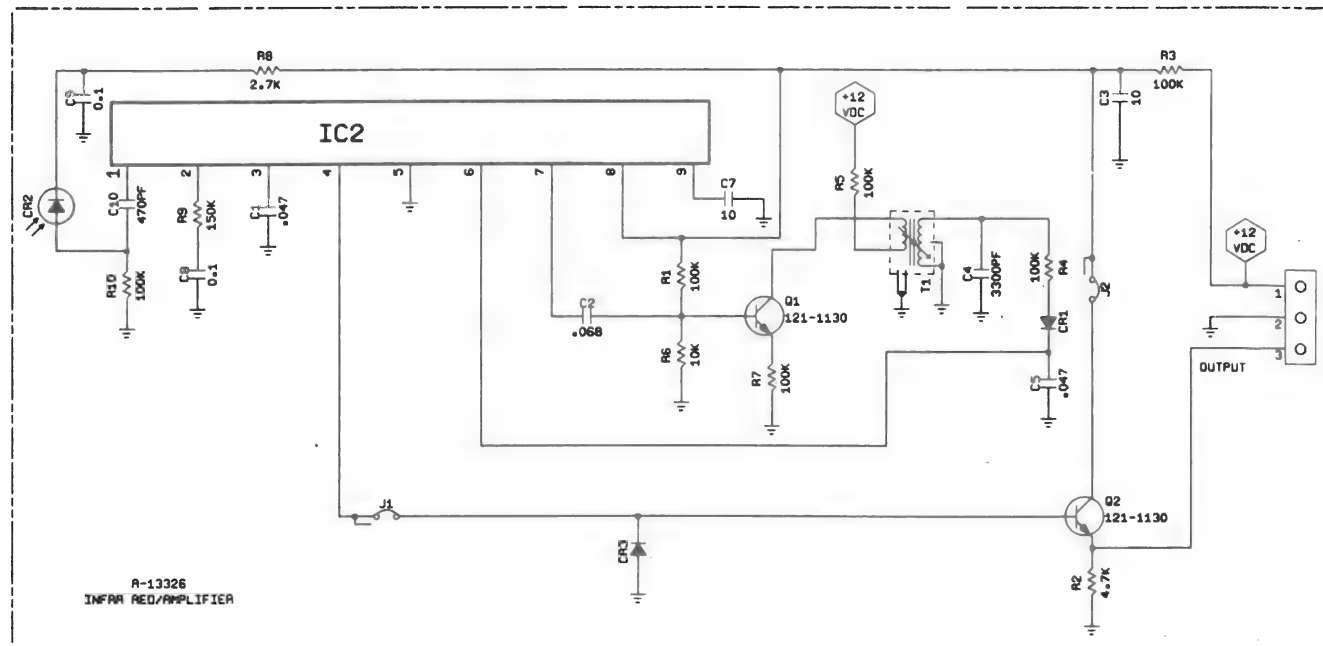








NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED.  
 $\Delta$  TAKEN FROM COMMON TIE POINT



INFRARED DETECTOR/AMPLIFIER (A-13326)

INFRARED DETECTOR/AMPLIFIER (A-13326)  
PARTS LIST

A-13326 DETECTOR/AMP ASSEMBLY, INFRARED SPACE COMMAND		
REF. NO.	PART NO.	DESCRIPTION
C1	22-8003	.047MFD 5% 50V CERAMIC CHIP CAP. (2 REQ)
C2	22-8003-01	.068MFD 5% 50V CERAMIC CHIP CAP.
C3	22-8020-12	10MFD 20% 16V ELECTRO CAP. (2 REQ)
C4	22-7759-01	330pF 10% 100V LAYERED CERAMIC CAP.
C5	22-8003	.047MFD 5% 50V CERAMIC CHIP CAP.
C7	22-8020-12	10MFD 20% 16V ELECTRO CAP.
C8	22-8003-02	.1 MFD 5% 50V CERAMIC CHIP
C9	22-8003-02	.1MFD 5% 50V CERAMIC CHIP CAP. (2 REQ)
C10	22-7936-02	470pF 20% 50V CERAMIC CAP
CR1	103-398	LOW VOLTAGE DIODE
CR2	162-12	PHOTO-DIODE, INFRARED CONDUCTIVE
CR3	103-398	LOW VOLTAGE DIODE
IC1	221-187	INTEGRATED CIRCUIT, AMPLIFIER
J1	63-10979	ZERO OHM 5% 1/8W FILM RES.
J2	63-10979	ZERO OHM 5% 1/8W FILM RES.
Q1	121-1130	TRANSISTOR
Q2	121-1130	TRANSISTOR
R1	63-10979-93	100K OHM 5% 1/8W FILM RES.
R2	63-10979-62	4.7K OHM 5% 1/8W FILM RES.
R3	63-10979-24	100 OHM 5% 1/8W FILM RES.
R4	63-10979-70	10K OHM 5% 1/8W FILM RES.
R5	63-10979-24	100 OHM 5% 1/8W FILM RES.
R6	63-10979-70	10K OHM 5% 1/8W FILM RES.
R7	63-10979-24	100 OHM 5% 1/8W FILM RES.
R8	63-10979-57	2700 OHM 5% 1/8W FILM RES.
R9	63-10979-28	150 OHM 5% 1/8W FILM RES.
R10	63-10979-93	100K OHM 5% 1/8W FILM RES.
T1	95-3792	RCF TRANSFORMER
	43-2034	INFRARED DETECTOR HOUSING
	58-489-03	3 CIRCUIT CONNECTOR
	126-2348-01	INFRARED DETECTOR SHIELD
	126-2349	GRILLE, IR DETECTOR
	192-748	INFRARED FILTER LENS
	194-863	DIODE SPACER
	194-1448-01	INSULATING STRIP

Courtesy of Manufacturer

## INFRARED DETECTOR/AMPLIFIER MODULE (A-13326)

## MISCELLANEOUS ADJUSTMENTS

## PRETUNE

1. Connect antenna.
2. Momentarily depress the Power button.
3. Set b'cast/CATV button to desired band by repeatedly depressing button until proper symbol appears in channel display window. Set to b (broadcast), c (CATV), h (HRC Cable) or i (ICC Cable).
4. Set AFC button by repeatedly depressing button until proper symbol appears in channel display window. Set to F (fixed, or standard broadcast) or S (Search for CATV or video games).
5. Select channel to be removed from memory. Use channel Up and Channel Down buttons.
6. Press the Skip button. PO (program out) will be displayed.
7. Repeats steps 5 and 6 to remove other channels from memory.

Adding channels to memory:

8. Follow steps 1 thru 4.
9. Select channel. Use direct channel access buttons.
10. Press the Enter button
11. Repeat steps 9 and 10 to add other channels.

NOTE: Unless otherwise indicated all adjustments were made with the following control settings: CATV Switch (SW600) to Broadcast, AFC Switch (SW6001) to Search. Picture (Part of R235), Black Level (Part of R2350), Tint (Part of R2350), Color (Part of R2351) and Sharpness (Part of R2351) to Normal viewing levels.

## B+ CHECK

Tune in a picture. Connect a Digital DC voltmeter to TP3204 (ICX3202, pin 4) low side to AC ground. With AC line voltage set to 120VAC, B+ should read 123V +/- 1VDC.

## HIGH VOLTAGE CHECK

Tune in a picture. Set Picture (Part of R235), Color (Part of R2351) and Black Level (Part of R2350) to MINIMUM. Connect a high voltage probe to CRT anode. High voltage should read 17.0KV to 17.9KV. High voltage must never exceed 18KV under any conditions.

## AGC DELAY ADJUSTMENT

Tune in a weak picture. Adjust AGC Delay Control (R1231) clockwise until snow (noise) appears in picture, then counterclockwise until snow disappears.

## VOLUME PRESET ADJUSTMENT

Tune in a picture. Set Volume to Midrange. Adjust Volume Preset Control (R1451) for desired volume level.

## COLOR FILTER ADJUSTMENT

Tune in a color bar pattern. Connect a DC voltmeter to TP2390 (wiper of R2390). Adjust Color Filter Control (R2390) for 4.0VDC.

## BRIGHTNESS LEVEL ADJUSTMENT

Tune in a picture. Set Black Level (Part of R2350) to Detent, Color (Part of R2351) and Picture (Part of R2350) to MINIMUM. Adjust Brightness Range (Part of R2351) for just visible picture.

## COLOR PURITY ADJUSTMENT

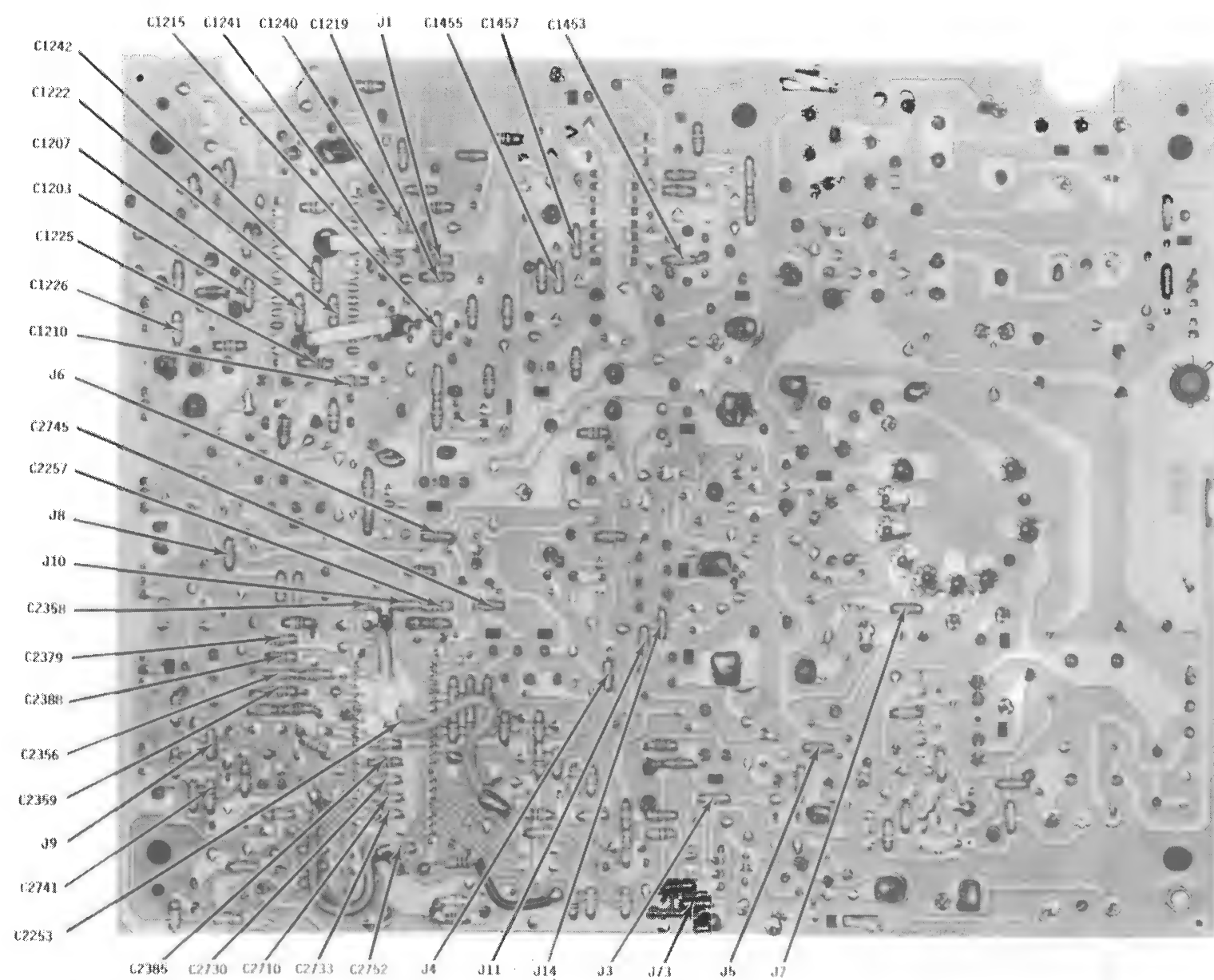
Operate set for 20 minutes. Use a degaussing coil to demagnetize CRT and mounting brackets. Set Color (Part of R2351) and Picture (Part of R2350) Controls to MINIMUM. Remove Jumper Plug (1M). Set Black Level (Part of R2350) for a visible raster. Set Blue (R5112) and Green (R5114) Controls to MINIMUM. Advance Red (R5113) Control to produce a red raster. Loosen Deflection Yoke clampscrew and slide the yoke backward. Adjust purity tabs to center the vertical red band. Slide the yoke forward until a uniform red screen is obtained. Check Blue and Green purity. Tighten Deflection Yoke clampscrew. If corner purity still needs correction, order Picture Tube Correction Kit (p/n 949-50). Place Correction Magnet on CRT rear near yoke, move magnet around to find best correction. Tape in place with fiberglass tape. Repeat purity adjustment.

## BLACK AND WHITE TRACKING ADJUSTMENT

Tune in a picture. Set Color (Part of R2351) and Picture (Part of R2350) to MINIMUM. Set Black Level (Part of R2350) to Detent. Set Blue (R5112), Red (R5113) and Green (R5114) Controls to MINIMUM. Set Screen Control (R3249B) to MINIMUM. Remove power from set, remove Plug 2A3 (Vertical Deflection) and Jumper Plug (1M), then restore power. Advance Screen Control until a dim line of one color appears. Advance 2 Color Controls to produce a white line. Set Black Level and Picture to Maximum. Check tracking. Touch up Color Controls as necessary for best black and white picture.

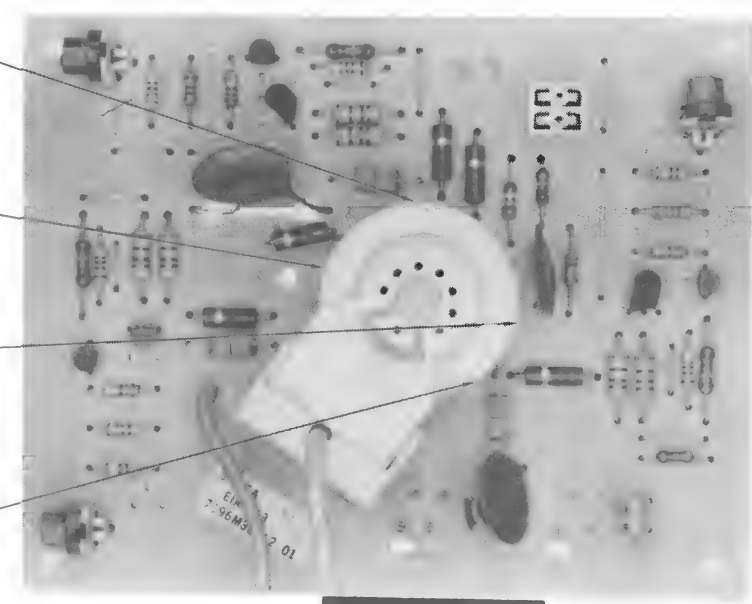
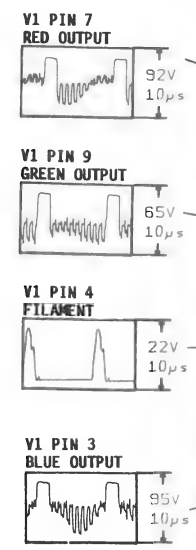
## CONVERGENCE ADJUSTMENTS

Connect a color bar generator to the antenna terminals and tune in a dot pattern. Loosen locking ring. Adjust 4-pole magnet tabs to converge the red and blue dots at the center of the screen. Adjust the 6-pole magnet tabs to converge the red/blue dots over the green dots at the center of the screen. NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge vertically and rotate both tabs in the same direction to converge horizontally. 4 and 6-pole magnets interact, repeat adjustment until center convergence is correct. Tighten locking ring. Tune in a crosshatch pattern. Remove rubber wedges between the Deflection Yoke and the CRT. Tilt Deflection Yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the right and left sides of the screen. Tilt the Deflection Yoke right and left to converge the horizontal lines at top and bottom of the screen and the vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace the rubber wedges. Tighten yoke clampscrew.

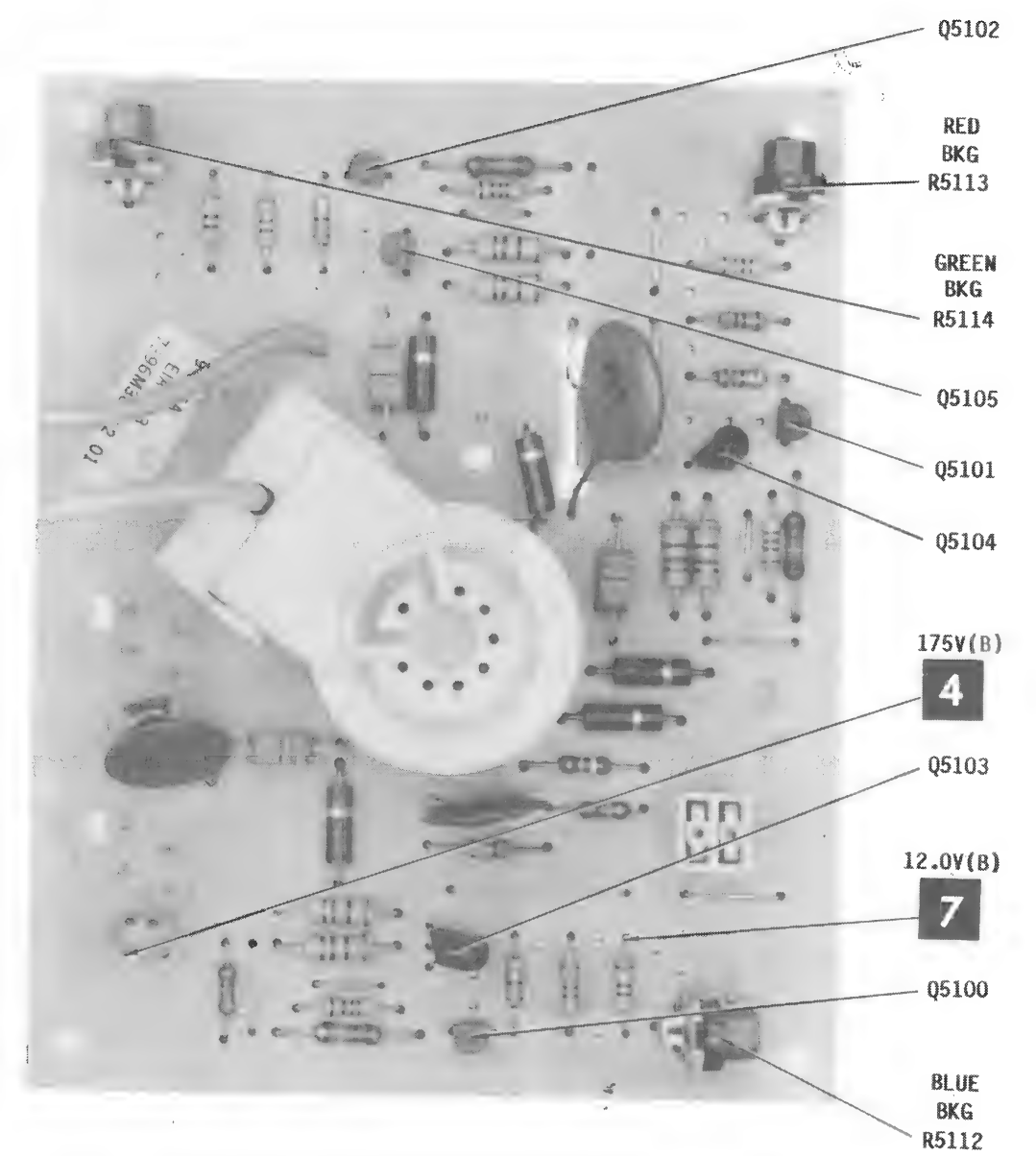


MAIN BOARD-BOTTOM VIEW

MAIN BOARD-BOTTOM VIEW



CRT BOARD

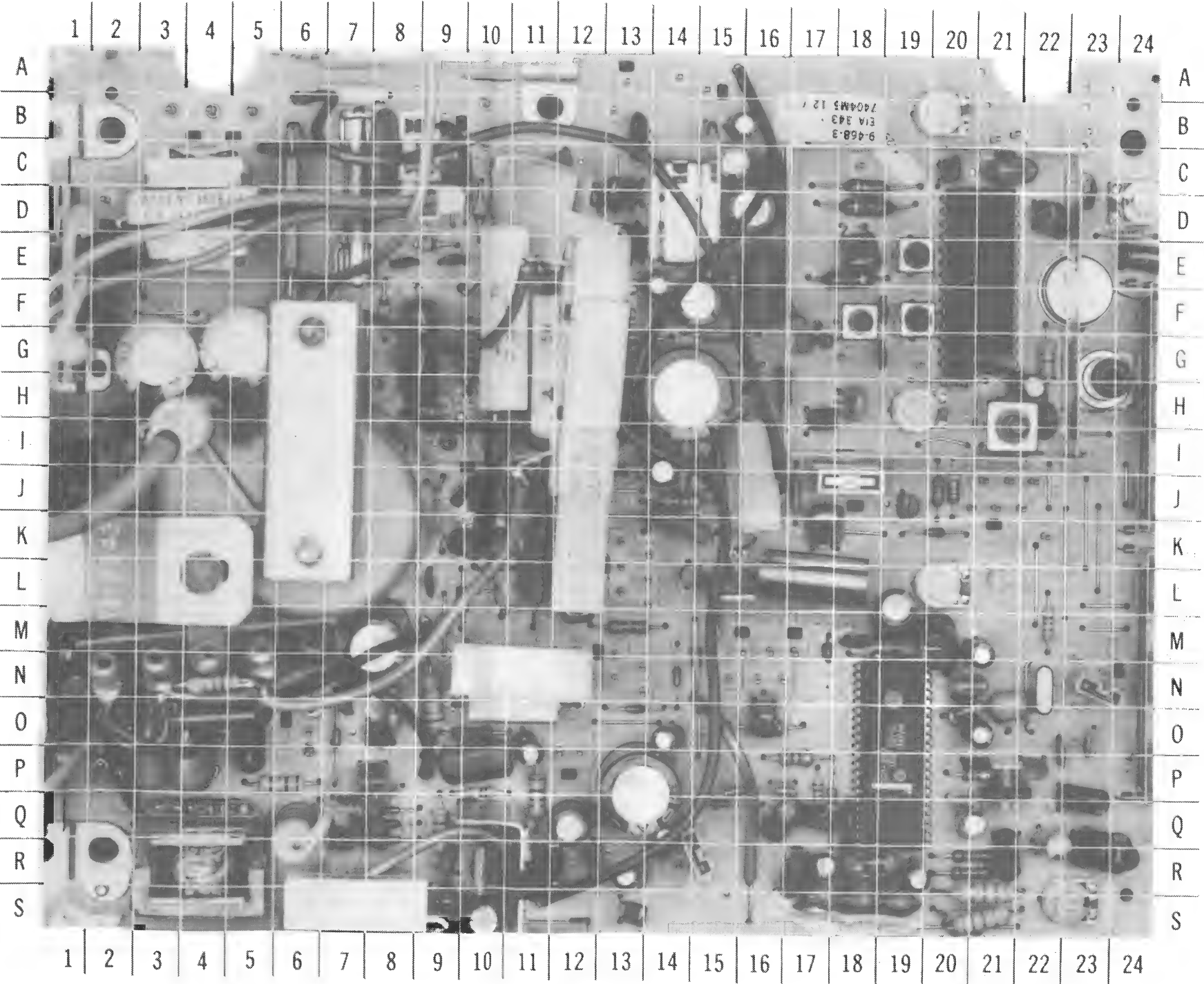


CRT BOARD



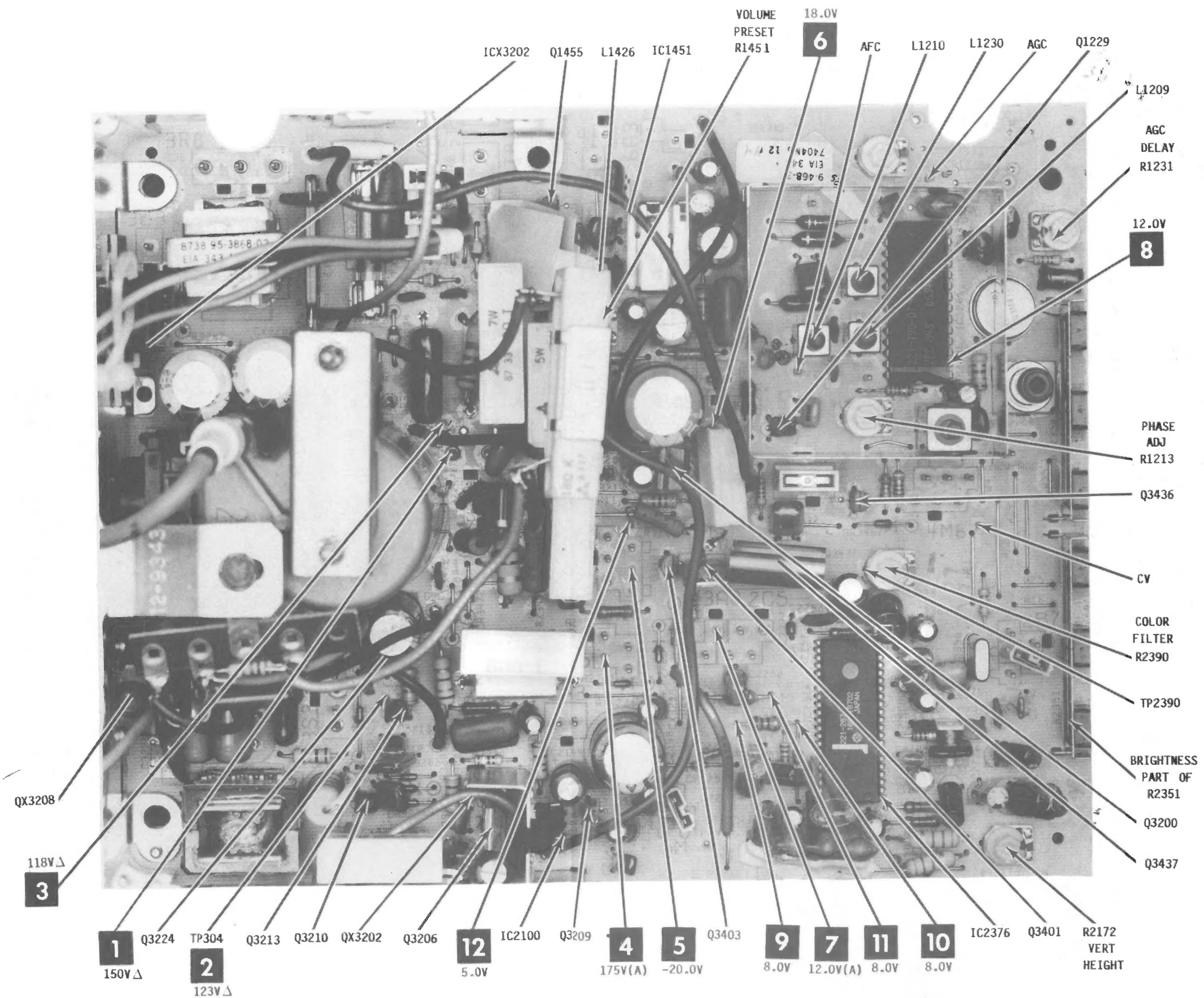
MAIN BOARD-GridTrace LOCATION GUIDE

AFC	G-18	C3261	O-5	LX2377	P-17	Q3403	L-14	R1244	B-20	R2714	R-21	R3406	L-16	RX3214	P-10	RX3468	L-11	2A3	O-12	3T8	B-10
AGC	B-21	C3270	E-9	LX2379	O-16	Q3436	J-19	R1451	F-13	R2715	S-21	R3463	J-17	RX3225	S-8	RX3470	L-11	2B7	N-23	3U3	I-10
C30	O-4	C3271	C-9	Q1229	H-17	Q3437	L-17	R1455	D-15	R2716	R-21	R3467	K-12	RX3233	O-10	RX3477	N-11	2C5	M-17	3X5	M-6
C1206	H-22	C3272	E-8	Q1455	C-12	QX3202	Q-10	R2172	S-23	R2745	Q-17	RX1454	E-15	RX3237	O-11	RX3496	L-10	3A5	N-13	4L4	A-13
C1210	H-20	C3437	J-11	Q3200	I-15	QX3208	O-1	R2257	M-19	R3213	P-6	RX1456	G-13	RX3248	F-10	TX3204	J-6	3A8	M-16	4K4	F-12
C1216	G-18	C3438	K-17	Q3206	R-10	R44	N-4	R2350	I-24	R3216	Q-6	RX1457	G-13	RX3249	G-10	TX3205	R-4	3C4	H-13	4P4	G-16
C1217	F-18	C3468	H-14	Q3209	R-12	R1201	G-22	R2351	O-24	R3220	Q-9	RX1460	G-15	RX3261	G-2	TX3298	D-4	3E3	D-2	4M6	J-21
C1227	C-21	C3469	N-10	Q3210	Q-7	R1213	H-19	R2381	M-22	R3234	P-10	RX2106	Q-11	RX3274	A-7	U1201	E-23	3K6	K-13	5M	R-15
C1229	J-20	C3470	J-11	Q3213	O-8	R1230	D-24	R2390	L-20	R3263	K-14	RX2704	M-13	RX3297	D-11	U1230	H-18	3R8	B-4	6A3	A-14
C1233	D-22	C3471	K-10	Q3224	N-17	R1231	D-24	R2711	P-17	R3267	J-14	RX3200	L-12	RX3408	J-16	U1402	B-13	3S3	O-6		
C1235	C-20	C3472	L-9	Q3401	L-15	R1232	J-20	R2713	R-21	R3404	M-15	RX3201	E-2	RX3464	G-11	1M	J-18	3S8	C-8		
C1243	E-18	C3796	M-8																		
C1251	C-23	CR5	O-2																		
C1299	G-17	CR2149	R-11																		
C1426	E-13	CR2253	Q-15																		
C1427	D-12	CR2356	N-22																		
C1429	D-13	CR2701	O-13																		
C1451	F-15	CR2702	N-14																		
C1452	F-14	CR3201	Q-8																		
C1456	F-16	CR3202	Q-8																		
C1459	D-16	CR3203	Q-8																		
C1460	B-16	CR3210	R-10																		
C1461	C-16	CR3216	O-7																		
C1462	C-15	CR3220	O-7																		
C1463	B-15	CR3409	M-15																		
C1466	D-12	CR3467	K-20																		
C2118	R-18	CR3468	I-12																		
C2124	Q-11	CR3469	J-11																		
C2125	S-9	CR3472	L-10																		
C2130	P-10	CR3473	J-10																		
C2131	R-13	CR3473A	J-10																		
C2148	P-14	CR3487	M-9																		
C2149	Q-12	CRX3200	I-14																		
C2152	R-14	CRX3214	E-3																		
C2171	R-23	CRX3271	D-10																		
C2250	P-16	CRX3272	C-9																		
C2251	R-17	CRX3273	E-9																		
C2252	Q-16	CRX3274	F-8																		
C2254	R-17	CX3201	O-11																		
C2280	O-16	CX3202	G-3																		
C2281	Q-17	CX3205	G-5																		
C2282	M-18	CX3219	O-14																		
C2355	N-20	CX3222	P-2																		
C2362	O-21	CX3225	I-10																		
C2365	M-19	CX3228	P-3																		
C2376	O-22	CX3229	P-4																		
C2377	P-22	CX3231	N-3																		
C2378	O-20	CX3299	C-8																		
C2381	P-21	EX3201	D-6																		
C2382	M-21	FX3299	C-7																		
C2384	P-23	IC1201	G-21																		
C2389	P-21	IC1451	C-14																		
C2390	M-20	IC2100	R-12																		
C2393	N-20	IC2376	Q-19																		
C2701	P-20	ICX3202	E-1																		
C2704	Q-18	J1201	H-23																		
C2707	P-17	L1203	C-18																		
C2715	R-19	L1204	H-21																		
C2726	Q-22	L1209	F-19																		
C2727	Q-21	L1210	F-18																		
C2731	Q-21	L1211	E-18																		
C2742	Q-23	L1226	E-24																		
C2746	S-13	L1230	E-19																		
C3200	H-13	L1231	H-16																		
C3203	Q-8	L1232	D-18																		
C3209	Q-10	L1426	E-13																		
C3210	P-8	L2276	S-18																		
C3211	S-9	L2277	M-17																		
C3213	P-8	L2288	S-21																		
C3214	J-14	L2376	P-21																		
C3223	M-12	L2378	O-21																		
C3224	O-7	L3210	N-1																		
C3233	G-9	L3499	K-10																		
C3237	J-10	LX1201	H-22																		



A Howard W. Sams GRIDTRACE™ Photo

ZENITH MODELS  
D0920A/D/K/U, D0930S, SD0921A/S



NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED.  
 Δ TAKEN FROM COMMON TIE POINT.



PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	
CR5 CR2149 CR2253 CR2701,2 CR3201 CR3202 CR3203	103-254-01 103-142-01 103-142-01 103-254-01	NTE116 NTE177 NTE177 NTE116	ECG116 ECG177 ECG177 ECG116	SK3313/116 SK9091/177 SK9091/177 SK3313/116	
CR3210 CR3216 CR3220 CR3409 CR3467 CR3468 CR3469	103-142-01 103-295-02 103-295-02 103-336-15 103-309-01	NTE177 NTE177 NTE177 NTE5015A NTE5019A	ECG177 ECG177 ECG177 ECG5015A ECG5019A	SK9091/177 SK9091/177 SK9091/177 SK7A5/5015A SK10A/5019A	
CR3472 CR3473 CR3473A CR3487 CRX3200 CRX3214 CRX3271,2,3,4	103-254-01 103-368-03 103-368-03 103-326 103-412 103-254-01 103-315-06	NTE116 NTE552 NTE552 NTE552  NTE116 NTE116	ECG116 ECG552 ECG552 ECG552  ECG116 ECG116	SK3313/116 SK9000/552 SK9000/552 SK9000/552  SK3313/116 SK3313/116	#
IC1201 IC1451	221-190-01 221-158-03 A-9982-07	NTE875 NTE1231A NTE1231A	ECG875 ECG1231A ECG1231A	SK7725/875 SK9384/1231A SK9384/1231A	
IC2100 IC2376 ICX3202	221-347 221-267 223-18-01		ECG1788  ECG1776	SK9743	
Q1229 Q1455 Q3200 Q3206 Q3209	121-499 121-973 121-966-03 121-1037 121-975	NTE123AP NTE159 NTE152 NTE171 NTE123AP	ECG123AP ECG159 ECG152 ECG171 ECG123AP	SK3854/123AP SK3466/159 SK3893/152 SK3201/171 SK3854/123AP	
Q3210 Q3213 Q3224 Q3401 Q3403,36	121-1146 121-1101 121-1101 121-966-03 121-499-01	NTE287 NTE159 NTE159 NTE152 NTE123AP	ECG287 ECG159 ECG159 ECG152 ECG123AP	SK3433/287 SK3466/159 SK3466/159 SK3893/152 SK3854/123AP	
Q3437 Q5100,01,02 Q5103,4,5 QX3202 QX3208	121-966-03 121-895 121-1140 121-975 121-1141	NTE152 NTE123AP NTE399 NTE123AP NTE2302	ECG152 ECG123AP ECG399 ECG123AP ECG2302	SK3893/152 SK3854/123AP SK9352/399 SK3854/123AP SK9422	

# For SAFETY use only equivalent replacement part.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C2727 C2731 C3249 # CX3201	.47 50V 10% 1 35V NP 470 200V 4.7 35V	22-7669-11 22-7406-01 22-7908-02 22-7861-04

# For SAFETY use only equivalent replacement part.  
Items Not Listed Are Normally Available At Local Distributors.

ITEM No.	RATING	MFGR. PART No.
# CX3202 # CX3205 # CX3219	33 200V 33 200V 1 50V	22-7962-14 22-7962-14 22-7862-01

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	ITEM No.	RATING	MFGR. PART No.
C1210 C1211 C1213 C1215 C1216 C1217 C1219 C1222 C1226 C1240 C1241 C1426 C1453	13 NPO 50V 5% 56 NPO 50V 5% 2.2pF NPO 50V 10% 30 NPO 50V 5% 51 NPO 50V 5% 51 NPO 50V 5% 5.6pF NPO 50V 10% 2.2pF NPO 50V 10% 24 N220 50V 5% 180 NPO 50V 10% 68 NPO 50V 5% 120 N150 50V 5% 8.2pF P030 50V 10%	22-7743-15 22-8035-30 22-8033-04 22-8034-23 22-7621-27 22-7621-27 22-8033-04 22-8034-21 22-8030-01 22-8035-32 22-7631-35	C2282  C2355 C2356 C2359 C2376 C2377 # CX3222 # CX3225 # CX3228 # CX3229 # CX3231 # CX3299	100 NPO 50V 5% 82 51 NPO 50V 5% 33 NPO 50V 5% 11 NPO 50V 5% 75 N150 50V 5% 68 N150 50V 5% 530 3KV 10% .0047 500V .0027 1.6KV 5% .0027 1.6KV 5% 530 3KV 10% .01 500V .0047	22-7621-34  22-7621-27 22-8033-24 22-8033-13 22-7631-30 22-7631-29 22-8063 22-7431-06 22-7672-34 22-7672-34 22-8063 22-7431-07

# For SAFETY use only equivalent replacement part.  
Items Not Listed Are Normally Available At Local Distributors.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

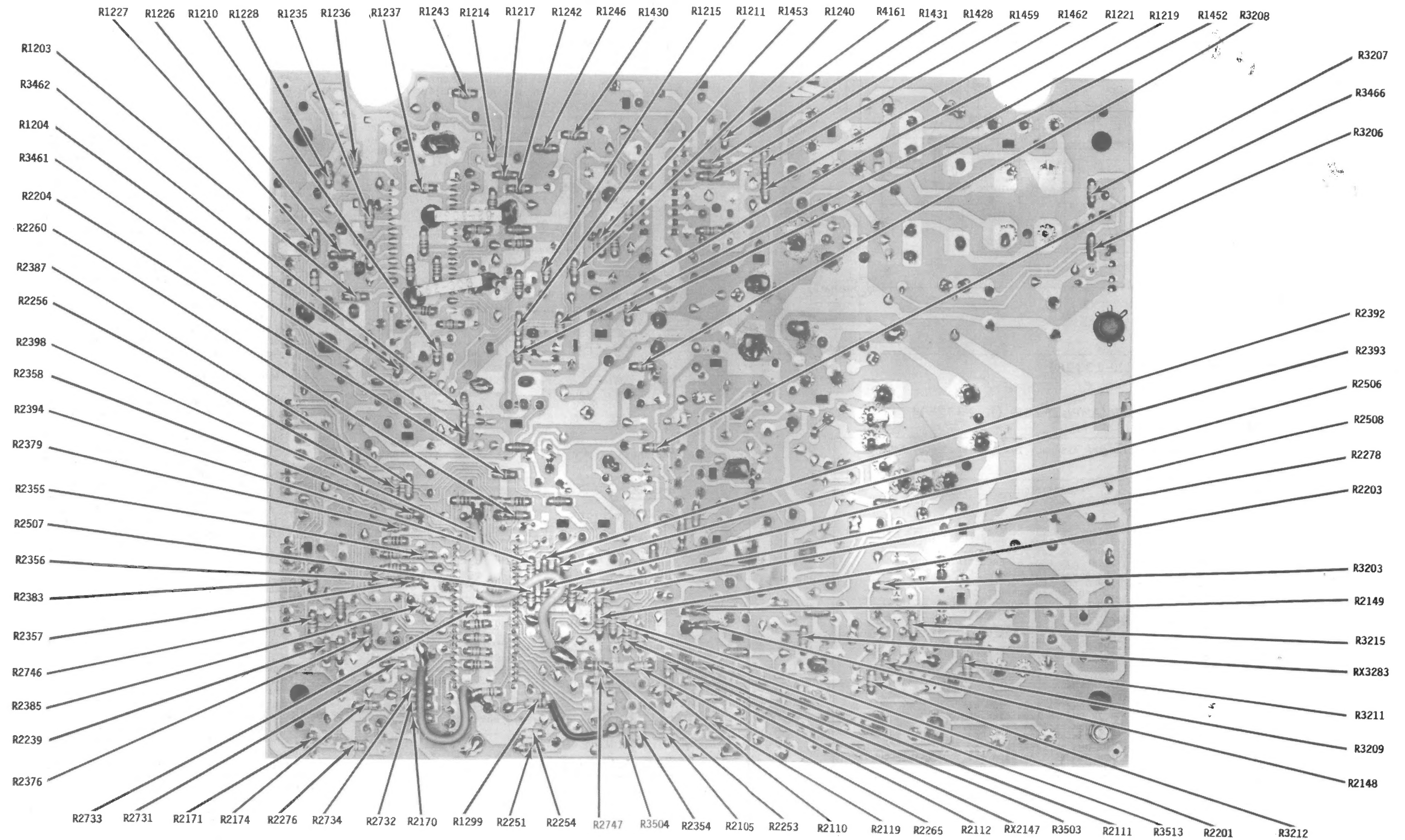
ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R1213 R1231 R1244 R1451 R1499 R2172 R2350 R2350 R2350 R2351 R2351 R2351 R2390 # R3249A B R5112 R5113 R5114	Phase Adjust AGC Delay Zero Carrier Volume Preset Volume Vertical Height Tint Picture Black Level Sharpness Brightness Range Color Color Filter Focus Screen Blue Background Red Background Green Background	10K 10K 10K 5000 15K 2000  Detent @ 50% Detent @ 50%  10K 20M 1500 1500 1500	63-10857-12 63-10857-12 63-10857-12 63-10857-36  63-10857-08 (3) (3) (3) (2) (2) (2) 63-10857-12 (1)  63-10854-18 63-10854-17 63-10854-19	

# For SAFETY use only equivalent replacement part.  
(1) R3249A and R3249B are part of Horizontal Output Transformer #TX3204, Part Number 95-3816-02.  
(2) Control Assembly Part No. 63-11032.  
(3) Control Assembly Part No. 63-11032-01.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA	
		MFGR. PART No.	NTE PART No.
# R1455 R2745 R3216 R3404 R3405 R5100 R5101 R5102 R5103 R5104 R5105 R5109 R5110 R5111 R5115	82 5% 1/4W Carbon Film 11K 25 1/4W Carbon Film 1000 5% 3W Metal Film 750 2% 1/4W Carbon Film 1500 2% 1/4W Carbon Film 5100 2% 1/4W Carbon Film 5100 2% 1/4W Carbon Film 5100 2% 1/4W Carbon Film 390 2% 1/4W Carbon Film 360 2% 1/4W Carbon Film 390 2% 1/4W Carbon Film 680 2% 1/4W Carbon Film 620 2% 1/4W Carbon Film 680 2% 1/4W Carbon Film 150K 2% 1/2W Carbon Film	63-10235-46 63-10233-97  63-10233-69  63-10233-89 63-10233-89 63-10233-89 63-10233-62 63-10233-61 63-10233-62 63-10233-68 63-10233-67 63-10233-68 63-10242-24	QW082 QW011 3W210 QW175 QW215 QW251 QW251 QW251 QW139 QW136 QW139 QW168 QW162 QW168 HW415





MAIN BOARD-BOTTOM VIEW

MAIN BOARD-BOTTOM VIEW

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description  
RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	
R5116	150K 2% 1/2W Carbon Film	63-10242-24	HW415	
R5117	150K 2% 1/2W Carbon Film	63-10242-24	HW415	
# RX1454	1 5% 1/2W Carbon Film	63-10243	HW1D0	
# RX1456	3.3 5% 1/2W Carbon Film	63-10565-12	HW3D3	
# RX1457	3.3 5% 1/2W Carbon Film	63-10565-12	HW3D3	
# RX1460	3.3 5% 1/2W Carbon Film	63-10565-12	HW3D3	
# RX2106	1 5% 1/2W Carbon Film	63-10243	HW1D0	
# RX2147	2.7 5% 1/4W Carbon Film		QW2D7	
	1.8 5% 1/4W Carbon Film	63-11020-07	QW1D8	
# RX2704	1100 5% 1/2W Carbon Film	63-10243-73	HW211	
# RX3200	24 5% 5W WW			
	27 5% 5W WW	63-10442-58	5W027	
# RX3201	10K 5% 1/2W Metal Film	63-10828-96	HW310	
# RX3205	130 5% 20W WW	63-10482-75		
# RX3208 (R3208)	62 5% 1/4W Tubular Leadless	63-11020-44		
# RX3214	3600 2% 1/4W Carbon Film		QW236	
	3300 2% 1/4W Carbon Film	63-10233-84	QW233	
# RX3217	2700 5% 1W Metal Film		1W227	
	2000 5% 1W Metal Film	63-10832-79	1W220	
# RX3224	15 5% 1/2W Carbon Film	63-10828-28 (1)	HW015	
# RX3225	390 5% 5W WW	63-10442-86	5W139	
# RX3233	300 5% 1/2W Carbon Film		HW130	
	680 5% 1/2W Carbon Film	63-10243-68	HW168	
# RX3237	3.6 5% 2W WW	63-10420-37		
# RX3248	2 5% 7W WW	63-10449-31		
# RX3249	18K 5% 2W Metal Film	63-10837-02	2W318	
# RX3261	18 10% 10W WW	63-11037-01	10W018	
# RX3274	1.2M 20% 1/2W Carbon Film	63-10657-03 (1)	HW512	
# RX3283	510 5% 1/4W Tubular Leadless	63-11020-66		
# RX3297	13.3 Cold PTC	63-10710		
# RX3408	39 5% 3W WW	63-10428-62		
# RX3464	6.2 5% 5W WW	63-10442-43		
# RX3468	220 5% 1/2W Carbon Film	63-10565-56	HW122	
# RX3470	9100 5% 2W Metal Film	63-10836-95	2W291	
# RX3477	33 5% 5W WW	63-10442-60	5W033	
# RX3496	8200 5% 2W Metal Film	63-10836-94	2W282	

# For SAFETY use only equivalent replacement part.  
(1) May be found in some versions.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
L1203	Peaking (1uH)	20-3907	L2277	Peaking	20-3887-13
L1204	Video IF	20-3938-06	L2288	Peaking (22uH)	20-3907-16
L1209	Limitter	20-4172-11	L2376	Chroma	95-3080-01
L1210	AFT	20-4172-12	L3378	Peaking	20-3887-20
L1211	Peaking	20-4029	L5100	RF Choke	20-3887-26
L1226	RF Choke	20-3858-01	# LX1201	RF Choke	20-4216-01
L1230	Oscillator	20-4172-06	# LX2377	RF Choke (10uH)	20-3907-12
L1231	Peaking (12uH)	20-3907-13	# LX2379	RF Choke (10uH)	20-3907-12
L1232	RF Choke	20-4029	# TX3298	Line Choke	95-3868-01
L1426	Quadrature	20-3800		Line Choke	95-3868-02

# For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# DY1	Yoke 90° Horiz 4.23mH Vert 24.2mH	95-3885	95-3885 (1)	
# TX3204	Horizontal Out	95-3816-02	A-14472-01 (1)	
# TX3205	Horizontal Driver	95-3848-01	873995-3848-01 (1)	

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description  
COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
TX1	Power	95-3650	95-3650 (1)	

# For SAFETY use only equivalent replacement part.  
(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1401	3" PM 32 Ohms	49-1258-06	30A05Z32	

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
CR2356	Crystal	224-27	(3.58MHz)
E5100	Spark Gap	52-2240-06	
E5101	Spark Gap	52-2240-06	
E5102	Spark Gap	52-2240-06	
J1201	Phone Jack	A-9058-07	Bracket Assembly
L2276	Delay Line	20-4016	
L3201	Degaussing	A-11104-05	Coil Assembly
	Degaussing	20-3884-31	Coil
L3205	Ferrite Bead	149-454	
L3210	Ferrite Bead	149-454	
P3201	Cord	A-9731-08	AC Line, Polarized
		11-364 (1)	
# RX3226	Wire	91-2053	22 Gauge
U1201	Filter	224-26-01	Crystal
U1230	Trap	224-23	Ceramic
U1402	Filter	224-4	Ceramic
# V1	CRT	A23JAN99X	
# EX3201	Spark Gap	38-102	4KV DC
# FX3299	Fuse	136-113-23	4 Amp @ 250VAC
	Antenna	A-14547-02	Assembly, UHF/VHF
	Antenna	1-142	UHF/VHF, Monopole
	Balun	A-9521-02	Assembly
	Convergence/Purity Magnet	A-9667	Assembly
	CRT Socket	A-11056-08	Assembly, w/Connector
	CRT Socket	A-11056-17	Assembly, w/Connector
	Display	A-13924-01	Keyboard/Channel Assembly
	Display	A-13924-02	Used In Models D0920A/D/K/U/S
	Earphone	39-56-01	Keyboard/Channel Assembly
	Earphone	78-2284	Used In Models SD0921A/S
	IR Detector/Amplifier	A-13326	Jack Assembly
	RC Network	A-14565-01	Assembly, Used In Models SD0921A/S
	Switch	A-14111-03	Assembly
	Transmitter	124-140-01	On/Off, Assembly, Used In Models D0920A/D/K/U/S
			S/C, Used In Model SD0921A/S

# For SAFETY use only equivalent replacement part.

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Cabinet, Front	14-11680-08 (1) 14-11680-09 (2) 14-11680-10 (3) 14-11680-11 (4) 14-11680-07 (5) 14-11680-12 (6) 14-11679-09 (10) 14-11679-10 (2) 14-11679-11 (3) 14-11679-12 (4) 14-11679-08 (5) 14-11679-13 (8)	Cabinet, Bottom	14-11678-03 (10) 14-11678-04 (9) 14-11678-02 (5)
Cabinet, Back		Handle, Assembly	36-841-06 (10) 36-841-07 (2) 36-841-08 (3) 36-841-09 (4) 36-841-10 (11)
		Thumbwheel Knob, Five (5) used	A-14115

- (1) Used In Model: D0920A
- (2) Used In Model: D0920D
- (3) Used In Model: D0920K
- (4) Used In Model: D0920U
- (5) Used In Model: D0930S
- (6) Used In Models: SD0921A/S
- (7) Used In Model: SD0921A
- (8) Used In Model: SD0921S
- (9) Used In Models: D0920D/K/U, SD0921S
- (10) Used In Models: D0920A, SD0921A
- (11) Used In Models: D0930S, SD0921S